

NAVAL POSTGRADUATE SCHOOL

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THESIS

**AN ANALYSIS OF ELECTRONIC COMMERCE
ACQUISITION SYSTEMS: COMPARISON OF A NEW
PURE ELECTRONIC PURCHASING AND EXCHANGE
SYSTEM (ELECTRONIC STOREFRONT) AND OTHER
LEGACY ON-LINE PURCHASING SYSTEMS**

by

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I. INTRODUCTION

A. PREFACE

The Department of Defense (DoD) and the Federal Government as a whole are in a state of increased implementation and use of Electronic Commerce (EC) / Electronic Procurement (EP) as a means to streamline Government procurement processes. Despite the growth in on-line procurement technology over the past decade, actual utilization of purchasing through on-line programs such as GSA Advantage and DoD EMALL has been slow. According to the research company Juniper Media Matrix Inc., Government agencies spent \$13.8 billion in 2000 buying goods and services on line, about one percent of their total procurement spending and that will expand to \$286 billion by 2005. On-line buying accounted for only one-half percent of the goods and services Federal agencies bought through the GSA. The report also addresses the fact that e-procurement has made even less progress at the state and local level. [Matthews, 2001]

In an attempt to increase the efficiency of the Government's procurement process, a team at the Naval Postgraduate School (NPS), a DoD educational and research institute, has conceived a new program considered to be a pure electronic purchasing and auctioning system that may be considered the next generation of Government purchasing software, and a possible replacement for current programs such as GSA Advantage! and DoD EMALL.

B. RESEARCH OBJECTIVE

This research describes and evaluates current on-line procurement programs in the DoD and the Federal Government as they relate to purchasing supplies and services. This research considers the benefits, barriers and risks involved in the newly developed Pure Electronic Storefront program and how it compares to current e-procurement programs in use by the Government.

C. RESEARCH QUESTIONS

1. Primary Research Question

What are some of the current Government acquisition/procurement programs, problems and issues associated with legacy systems and to what extent can the Pure Electronic Storefront system improve on the current systems in use?

2. Secondary Research Questions

- What is the history of Electronic Commerce/Electronic Procurement and other procurement programs?
- What are problems/weaknesses of some of the current electronic procurement programs?
- What advantages/solutions can the Pure Electronic Storefront System bring to the Government?

D. SCOPE AND ORGANIZATION

The scope includes: (1) a review of the background of electronic commerce/electronic procurement in the Federal Government; (2) a review of some of the current programs currently in use by the DoD, Federal and State Government; (3) a review of the newly conceived Pure Electronic Storefront program; and (4) the advantages the new Pure Electronic Storefront program will provide over current existing programs discussed.

E. METHODOLOGY

The methodology used in this thesis research consists of the following steps:

- Conduct a search of books, magazine articles, CD-ROM systems, Government Reports, Internet-based materials and other library information resources.
- Conduct interviews, as required, with key personnel linked to current Government electronic procurement programs.
- Conduct interviews, as required, with personnel from the Small Business Administration.

F. BENEFITS OF RESEARCH

This thesis is intended primarily to benefit the DoD, Federal agencies and purchasing agencies that currently utilize no electronic means of selling or ordering or currently use one of the many legacy programs such as GSA Advantage! or DoD EMALL. This critical review will provide Government decision makers with an alternative to current on-line procurement systems.

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II. E-COMMERCE/E-PROCUREMENT BACKGROUND/HISTORY

A. HISTORY/BACKGROUND OF ELECTRONIC COMMERCE /PROCUREMENT IN THE GOVERNMENT

Acquisition/procurement reform has been the topic of many discussions in Washington, D.C. The drive towards electronic acquisition and procurement reform started with the Clinton-Gore Administration, with their push to reinvent the Government. President Clinton's first step was establishing the National Performance Review, later followed by legislation including the Federal Acquisition Streamlining Act of 1994 and the Federal Acquisition Reform Act of 1996. The Bush-Cheney Administration continued the endeavor by making e-procurement an objective for electronic Government through the President's Management Agenda as a continued initiative to streamline and reform Government procurement. [McClure, 2001]

The World Wide Web (WWW) has also introduced many new changes and opportunities in the last few years that have dramatically broadened the scope of electronic commerce (EC). These days, EC encompasses all aspects of buying and selling electronically, including marketing and end-to-end transactions through a variety of technologies including Electronic Data Interchange (EDI), E-mail, Electronic Funds Transfers (EFT), and web-based applications. [GAO, May 2000]

What exactly is Electronic Commerce? According to the Federal Acquisition Regulation (FAR) Part 2, Electronic Commerce means electronic techniques for accomplishing business transactions including E-mail or messaging, World Wide Web technology, electronic bulletin boards, purchase cards, EFT, and EDI. According to the publication, *Introduction to EC: Handbook For Business*, EC is the interchange and processing of information using electronic techniques for accomplishing business within the framework of commercial standards and practices. Further, an integral part of implementing EC is the application of business improvements or reengineering principles to streamline business processes prior to the incorporation of technologies facilitating the electronic exchange of business information.” [JECPO, 2001]

Electronic Data Interchange is briefly discussed in this chapter as it relates to EC, and is discussed in greater detail in Chapter III. Briefly, EDI is the computer-to-computer exchange of business transaction information, in a public standard. EDI is a critical part of EC as it enables computers to exchange data electronically much faster, more cheaply and accurately than is possible via a paper-based system.

Although the Federal Government has been slow to embrace the concept of EC, over time it has come to see the significant benefits and costs savings that can be generated by conducting business in an electronic fashion. This chapter provides a chronology of key events, legislations and regulations that took place in the last ten years, which helped pave the road to EC in the Federal Government. Chapter III discusses some of the many software and on-line products in use today.

1. Traditional Public Bid Process

Why is there a need to streamline and automate the purchasing process? The traditional Government contracting and purchasing process is burdened with bureaucratic steps that significantly slow down, and at times completely halt, a process that was initially developed to promote efficiency, competition and accountability within the acquisition process. As with many Government processes, the traditional means of conducting Government procurement has developed into a process that moves at a snail's pace. A quick, simplified description of the basic contracting process is indicative of the slow process and the need for acquisition reform.

The traditional Federal acquisition process begins with a request by an agency for an item or service of need. The contracting officer prepares a solicitation, which is then advertised for up to fifteen days through a notice of proposed contract action. Normally, companies are allowed up to forty-five days to submit offers against that particular request for proposal (RFP). All responses received by the contracting officer from vendors are then evaluated and, based on that evaluation, the contracting officer awards that contract for that particular item or service. Acquisitions in excess of \$100,000 can take as much as six to nine months from start to finish. Traditional procurement

processes usually require substantial lead-time, which results in slow and ineffective acquisition methods. [Lee, 2002]

2. National Performance Review

In March 1993, President Clinton initiated the National Performance Review (NPR) that Vice-President Al Gore was assigned to lead. About 250 career civil servants, interns, State and local Government employees on loan, and a few consultants staffed this review task force. With a six-month deadline, the NPR was chartered to review current Federal Government business practices [Gore, 1996]. In September 1993, the NPR task force presented their final report to the President called, “Creating a Government That Works Better and Costs Less” [Gore- NPR].

The NPR report included some 1200 recommendations and included proposals designed to make Government work better and cost less by reengineering through the use of information technology (IT) [Gore, 1996]. Among the many recommendations, the NPR stated it was imperative that Government strengthen and broaden its Electronic Commerce (EC)/Electronic Data interchange (EDI) capability within the acquisition system. Another recommendation included the establishment of a Government-wide program to use EC for all Federal acquisitions below a specified dollar threshold and for those acquisitions that use simplified acquisition procedures. [DUSD(AR), 1993] The hope was to further open up business opportunities, and to provide an incentive for businesses to conduct business with the Government electronically.

The recommendations concerning EC are partially rooted in the difficulty of conducting business with the Federal Government. The NPR pointed out in their report that excessive regulations made doing business with the Federal Government a cumbersome and trying experience. The Defense Department, at the time, had at least 880 laws under which it managed its procurement processes. The FAR alone was 1600 pages long, not counting another 2900 supplemental pages of agency-specific procurement regulations. In addition, the NPR cited that outdated bureaucratic rules stifled innovation, making delivery of goods and services designed to help the Government meet the needs of its citizens difficult, if not impossible. [Gorden-Murnane,

2001] The conclusions of the NPR served as the schematic for changes implemented across the entire Federal procurement culture and process. It was a step towards encouraging small businesses to participate in procurement offers by widening access to procurement offerings.

In December 1993, President Clinton, in a move to implement the NPR's recommendations, set forth 16 directives, including an Executive Memorandum promoting the use of EC throughout the Federal Government [Gray, 1996].

3. President Clinton's 1993 Memorandum

As a result of the NPR findings, in October 1993, an Executive Memorandum entitled, "Streamlining Procurement Through Electronic Commerce", was issued by President Clinton to streamline the procurement process and promote cost effectiveness. The memorandum focused on implementing EC/EDI capability within the Federal Government through mandated key objectives and milestones. [FEAT, 1994]

The memorandum stated, "... the electronic exchange of acquisition information between private sector and the Federal Government also will increase competition by improving access to Federal contracting opportunities for the more than 300,000 vendors currently doing business with the Government, particularly small businesses, as well as many other vendors who find access to bidding opportunities difficult under the current system. [Clinton, 1993]. Specific objectives set forth by the memorandum included:

- Exchange procurement information electronically between the Federal Government and the private sector to the maximum extent practical.
- Provide small, small disadvantaged, and women-owned businesses greater access to Federal procurement opportunities.
- Ensure potential suppliers are provided simplified access to the Federal Government's electronic commerce system.
- Use agency and industry systems and networks to enable the Government and potential suppliers to exchange information and access Federal procurement data. [Clinton, 1993]

Two of the milestones set forth in the Executive memorandum included:

- By September 1994 – establish an initial EC capability to enable the Federal Government and private vendors to electronically exchange

- standardized requests for quotations, quotes, purchase orders and notices and awards.
- By July 1995 – implement a full-scale Federal EC system that expands initial capabilities to include electronic payment, document interchange, and supporting databases.

4. DoD Electronic Commerce in Contracting Process Action Team and Federal Electronic Commerce Acquisition Team

As a response to the NPR and the Presidential Executive memorandum, various key teams were formed to help develop and implement EC throughout the Federal Government. One of those teams was the DoD Electronic Commerce in Contracting Process Acquisition Team (DoD ECIC PAT). The DoD ECIC PAT, formed under the direction of the Deputy Under Secretary of Defense for Acquisition Reform (DUSD (AR)) in July 1993, was chartered to analyze DoD's current EC capability and develop an implementation plan. [DUSD(AR), 1993]

The purpose of the team, consisting of representatives from all DoD agencies, was to immediately assess the DoD's current EC capabilities in contracting. In addition, the team was to develop a comprehensive plan for the completion of EDI for the procurement of simplified purchasing. One of the recommendations and actions was the formation of the DoD EC Office, to oversee the DoD's EC/EDI implementation efforts. [EC Handbook]

Also, in response to the Executive Memorandum, Federal Agencies formed a Federal Electronic Commerce Acquisition Team (ECAT). Tasked by the Office of Federal Procurement Policy (OFPP), this team was comprised of procurement and information technology specialists from the executive agencies [FEAT, 1994]. An ECAT report generated in October 1994 provided recommended actions to be taken within the executive department and agencies to effectively implement EC in the Federal Government within a three-year window. Some of the recommendations included:

- Coordinate and harmonize appropriate portions of their policies, practices, procedures, and systems so that they present a “single face” to the private sector for all aspects of Government acquisition.
- Pursue the implementation of EC in two phases: first, a near-term approach to implement an initial core capability by September 1994, to

conduct some of their business by EC; and second, by January 1997, implement EC throughout the Federal Government for all appropriate Federal purchases.

- Organize and use resources to conduct acquisition and related financial transactions over a “virtual network” that will link all appropriate buyers and sellers in an electronic marketplace.
- Participate with the OFPP and the President’s Management Council Electronic Task Force by developing individual agency plans for implementing EC in acquisition in accordance with the President’s 1993 Memorandum. [FEAT, 1994]

5. Federal Acquisition Streamlining Act (FASA)

One of the cornerstones to EC growth and use in the Federal Government was the Federal Acquisition Streamlining Act (FASA) (P.L. 103-355), which Congress passed in October 1994. FASA was generated to create a more equitable balance between Government-unique requirements and the need to lower the Government’s cost of doing business, and was designed to overhaul the Federal Government’s cumbersome and complex procurement system. The procurement system up to that point required costly paperwork for even the smallest purchases and sometimes took weeks or months of waiting between order and delivery of goods [DSMC, 2002]. FASA repealed or substantially modified more than 225 provisions of law to reduce paperwork burdens, facilitate acquisition of commercial products, and transform the acquisition process to electronic commerce and improve the efficiency of laws governing the procurement of goods and services. Some of the more significant improvements included:

- Emphasizing the acquisition of commercial items.
- Streamlining acquisition procedures under an elevated small purchase threshold.
- Implementing a Government-wide EC system (Federal Acquisition Computer Network (FACNET)).
- Establishing uniformity in the procurement system.
- Authorizing specific pilot programs. [EC/EDI Handbook]

The bottom line was that FASA offered Federal agencies the potential to see a cost savings in their procurement functions. This was done in part by increasing the small purchase limitations from \$25K to \$100K (only for those agencies that

implemented EDI). EDI was a way for agencies to avoid the costly and cumbersome contract procedures. Although FASA was generated to help develop a more equitable balance between Government-unique requirements and the need to lower the Government's cost of doing business, there was cause for concern among many of the commercial businesses. While FASA allowed the Government to buy commercial items on commercial terms, commercial companies found it difficult and costly to do business with the Government. One reason is that commercial firms were required to comply with the many Government-unique terms and conditions. [Drelicharz, 1994]

6. Federal Acquisition Reform Act of 1996/Clinger-Cohen Act

The next major step in reform came with the Federal Acquisition Reform Act (FARA) of 1996. The FARA was passed during the first session of the 104th Congress and built on the earlier FASA legislation. Included in the FY1996 DOD Authorization Act, FARA provisions further:

- Simplified procedures to procure commercial products and services, and at the same time preserved the concept of full and open competition.
- Reduced barriers to acquiring commercial products by eliminating the requirement for certified cost and pricing data for commercial products.
- Streamlined the bid protest process by eliminating the separated bid protest authority of the General Services Administration (GSA) Board of Contract Appeals and by providing for all bid protests to be adjudicated by the General Accounting Office (GAO).

In addition, to reflect the projected efficiencies due to acquisition reform and broader manpower reductions occurring at the DoD, FARA directed the DoD to reduce its acquisition workforce by 15,000 personnel during FY1996, and to report to Congress on how to implement an overall 25% reduction during the next five years.

The sister act of FARA, and a major piece of legislation during 1996 affecting the acquisition and information technology world, was the Information Technology Management Reform Act (ITMRA) that dealt with the IT procurement process. While originally passed as two separate initiatives, their impact on each other made it impossible to enact each singularly. The two acts were later combined and renamed the Clinger-Cohen Act.

According to Paul G. Kaminski, former USD for Acquisition and Technology, “The Clinger-Cohen Act of 1996 … further advanced the changes made by FASA. The Clinger-Cohen Act provides a number of significant opportunities for the DoD to further streamline and reduce non-value added steps in the acquisition process. Among the most significant changes authorized by the Act is a test of the use of the simplified acquisition procedures (SAP) for commercial items between the simplified acquisition threshold of \$100,000 and \$5 million. This should allow the DoD to reduce its administrative costs and overhead costs for the DoD’s vendor base for purchases of relatively low risk items. This change eliminated Government-unique requirements previously cited by industry as a barrier to doing business with the DoD. The Act also provides the authority for contracting activities to use SAPs for all requirements between \$50,000 and the SAP while the Government works to fully implement EC/EDI.”[DSMC, 2002]

7. Defense Reform Initiative

In November 1997, the Secretary of Defense initiated the Defense Reform Initiative (DRI). Through the DRI, the Secretary of Defense introduced the principles of Electronic Business (EB). The report stated, “a full commitment to EB operations will not only result in tangible savings, but will also change the DoD’s business culture, forcing managers to think differently and act more efficiently.” Using the principles of EB has resulted in the concept of EC being propelled beyond the EC standards process. [JECPO, 2001]

A Defense Reform Initiative (DRI) Report pointed out that few aspects of current business practices and systems used by the DoD are integrated. Overall, the DoD has 150 accounting systems, seventy-six procurement writing systems, numerous logistics systems, and one major contract administration and payment system, all of which process contract data. [GAO, 1998]

In November 1997, when the DoD announced the Defense Reform Initiatives, the notion of EB was given additional emphasis. The DRI called for the Department to revolutionize its business operations by adopting best practices, particularly those that promoted EB operations. In May 1998, to move ahead on the reform effort, the Deputy

Secretary of Defense established the Joint Electronic Commerce Program (JECP) to accelerate the use of EB practices and associated information technologies to improve defense operations. [GAO, 1998] The JECP office was then established by the Secretary of Defense to support, facilitate, and accelerate the use of e-commerce throughout the department. [GAO, 2000]

In November 1997, the Secretary of Defense released the Defense Reform Initiative Report (DRIR) introducing the principles of EB. The report stated, “a full commitment to EB operations will not only result in tangible savings, but will also change the DoD’s business culture, forcing managers to think differently and act more efficiently. Thus, by using EB principles, the concept of EC has been propelled beyond the EC standards process.

8. Joint Electronic Commerce Program Office/DoD EB/EC Office

The DoD set up a Joint Electronic Commerce Program Office, established by the Secretary of Defense under his Defense Reform Initiative (DRI), provided a central location designed to speed up the integration of EC techniques into DoD operations. The office is co-chaired by representatives from the GSA, and the DoD, who coordinates, monitors, and reports on the development of EC within the Federal Government. The JECP sponsors 17 Electronic Commerce Resource Centers (ECRC's) around the country to help medium and small-sized businesses to participate in the application of EC technology solutions in order to gain access to Federal procurement opportunities. [Gorden-Murnane, 2001]

In 2001, the JECPO was renamed the Defense Electronic Business Program Office within the DoD Chief Information Officer. The name change was to reflect the new DoD Directive 8190.2, the Department of Defense Electronic Business (EB)/Electronic Commerce (EC) Program.

9. Government Paperwork Elimination Act

Although the Government Paperwork Elimination Act (GPEA), P.L. 105-277, Title XVII, was not established specifically for the implementation of EC, it indirectly

promotes increased use of EC within the Federal Government acquisition/procurement processes. The GPEA allows citizens to use electronic technologies when filing information with, or retrieving it from the Federal Government. It allows Federal Agencies to allow the option of submitting information or transacting business with an agency electronically and is intended to help citizens gain one-stop access to existing Government information and services, and provide better, more efficient service while increasing Government accountability to citizens. The law encourages Federal Agencies to use a range of electronic alternatives. [OMB Circular]

The memorandum outlines the plan each agency must submit under OMB Memo M-00-10, “OMB Procedures and Guidance on Implementing the GPEA.” Developed to:

- Promote electronic Government.
- Improve efficiency.
- Improve customer service through the use of IT.

The most recent revision of the GPEA required Federal agencies, by October 2003, to allow individuals or entities that deal with the agencies the option to submit information or transact with the agency electronically, when practicable. This improvement involves transacting business electronically with Federal agencies and widespread use of the Internet and its World Wide Web [OMB Circular].

10. FAR Part 4.5

Federal Acquisition Regulation (FAR) Part 4.5, Electronic Commerce in Contracting, provides policy and procedures for the establishment and use of EC in Federal acquisitions as required by section 30 of the OFPP Act (41 U.S.C. 42b). FAR Part 4.5 states:

- The Federal Government shall use EC whenever practicable or cost effective.
- Agencies may exercise broad discretion in selecting the hardware and software that will be used in conducting EC.

As required by section 30 of the OFPP Act, the head of each agency, after consulting with the Administrator of OFPP, shall ensure that systems, technologies, procedures, and processes used by the agency to conduct EC:

- Are implemented uniformly throughout the agency, to the maximum extent practicable;
- Are implemented only after considering the full or partial use of existing infrastructures (e.g. FACNET);
- Facilitates access to Government acquisition opportunities by small business concerns, small disadvantaged business concerns, and women-owned small business concerns. [FAR Part 4.5]

B. CHAPTER SUMMARY

From the time President Clinton issued his memorandum in 1993 mandating the use of EDI and EC in the Federal acquisition process, the process has undergone a plethora of major changes. The first realistic incentive for the implementation of EC in the Federal acquisition community was FASA in 1994. FASA offered Federal agencies the potential to realize cost savings by incentivizing businesses to utilize EDI. This act helped businesses bypass some costly and cumbersome contract procedures. Following Federal legislation such as FARA further encouraged the development and use of EC in the Government. As is shown in Chapter III, the path towards EC has resulted in a number of programs designed to conduct EC on and off the Internet. Various teams and legislation implemented since the issuance of the NPR and the Presidential memorandum mentioned throughout this chapter have attempted to further the use of EC in the acquisition and procurement process. The various initiatives have resulted in a glut of software programs designed to redesign and enhance the use of EC in the acquisition process. Chapter III includes just a few of the many on-line EC programs in use by the Government in their acquisition process.

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III. CURRENT EC/E-PROCUREMENT SYSTEMS

A. INTRODUCTION

In keeping with the momentum of incorporating EC and E-procurement over the last ten years, the Federal Government has implemented various initiatives to reform and strengthen its buying processes electronically in order to reduce costs and enhance competitiveness in a “virtual” marketplace environment. These efforts were once again augmented by the Bush Administration’s announcement in early 2001 that expanding the application of on-line procurement in the Federal Government was one of its major reform initiatives [GAO, Oct 2001]. The Federal Government’s emphasis in on-line procurement does not come without good reason. There is a great need to reduce procurement costs and improve efficiency within the Government. This need exists beyond the Federal Government. Many periodicals contain examples of the success of EC and on-line procurement inside and outside the Federal Government, especially among small businesses.

According to The Boston Consulting Group, in 1998, U.S. Business-to-Business (B2B) EC was \$671 billion, which was comprised of \$92 billion in Internet-based transactions, and \$579 billion in Electronic Data Interchange (EDI) based transactions. It is expected that by 2003, B2B EC over the Internet will reach a transaction value of \$2.0 trillion. [BCG, 1999] According to research conducted by the Gartner Group, spending by Federal, State and Local Government e-procurement and on-line purchasing is expected to increase from \$1.5 billion in 2002 to \$6.2 billion in 2005 [GAO, May 2000].

The first official Government data on EC, of which e-procurement is a part, released by the U.S. Department of Commerce, estimated retail e-commerce sales at \$5.3 billion or .64 percent of total sales in the fourth quarter of 1999 [U.S. Census Bureau, Mar 2000]. The Census Bureau of the Department of Commerce recently announced that the estimate of U.S. retail e-commerce sales for the second quarter of 2002 was \$10.24 billion, an increase of 24.2 percent from the second quarter of 2001, as shown by Table 1.

[The report on e-commerce sales in Table 1 are not company purchases but are sales reported by retail firms indicating how much they sold through the internet.]

(Data in millions of dollars, not adjusted for seasonal, holiday and trading-day differences.)

PERIOD	RETAIL SALES ¹		E-COMMERCE AS A PERCENTAGE OF SALES
	TOTAL	E-COMMERCE ²	
1999 4 TH QTR	784,278	5481	.7
2000 1 ST QTR	711,600	5,814	.8
2000 2 ND QTR	771,691	6,346	.8
2000 3 RD QTR	765,536	7,266	.9
2000 4 TH QTR	810,311	9,459	1.2
2001 1 ST QTR	724,224	8,256	1.1
2001 2 ND QTR	805,245	8,246	1.0
2001 3 RD QTR	782,088	8,236	1.1
2001 4 TH QTR	856,285	11,178	1.3
2002 1 ST QTR	743,810	9,880	1.3
2002 2 ND QTR	825,532	10,243	1.2

¹ Does not include Food Services

² E-commerce sales are sales of goods and services where an order is placed by the buyer, or price and terms of sales are negotiated over an Internet, extranet, Electronic Data Interchange (EDI) network, electronic mail, or other online system.

Table 1. Estimated Quarterly U.S. Retail Sales: Total and E-commerce
From Ref. [U.S. Census Bureau, Aug 2002]

Small businesses also play a big role in the growth of EC and e-procurement. The marketing, promoting, buying, and selling of goods and services via electronic means has become a necessity for small businesses to conduct business, especially with the Government. The growth of IT, in conjunction with EC, has made it possible for small and medium-sized businesses to jump on the EC/e-procurement wagon and compete more effectively in a global market. Internet use by small businesses is on the rise. According to a private annual small business study in 1999, 47 percent of small

businesses had access to the Internet. The same study indicated that 35 percent of those small businesses maintained a website and one in three did business transactions through that website. Another survey indicated that 22 percent of small businesses used the Internet to sell goods and services while 9 percent used the Internet to purchase goods. [SBA, Jul 1999]

Reacting to widespread use of the Internet for selling and purchasing products and services, and the rise in the use of Government credit cards, a growing number of agencies developed electronic catalogs (E-catalogs) and Electronic Malls (E-Malls) to seize the opportunity for selling and purchasing products and services over the Internet. EMALLs and E-catalogs allow users to browse merchandise offered by Federal contractors and then place orders online. The GSA and Defense Logistics Agency (DLA) have made these two concepts a reality within the Federal Government and have incorporated the concept of catalogs and shopping malls from the online world [O'Hara, 1998].

This chapter includes brief descriptions of just a few of the many EC/e-procurement-type programs currently available for use by the Federal, State and Local Governments. The number of EC and on-line procurement programs within and outside the Federal Government are too many to include in the confines of this thesis. Therefore, only a few of the better-known programs are discussed. In addition, where data was available, some of the problems and issues concerning those programs are discussed. It is these issues and problems that are compared to the new electronic storefront program described in Chapter IV.

B. FEDERAL EC TOOLS CURRENTLY IN USE

1. Electronic Data Interchange

Electronic Data Interchange (EDI) is an integral part of EC and is the computer-to-computer electronic exchange of business information using a public standard format. This exchange takes place between trading partners. In the Government world, trading partners are those businesses that are registered with the Central Contracting Registry (CCR) and are able to conduct business electronically. [JEPCO, 2001]

Although EDI was first used by the transportation industry in the 1970's, it did not become widely used throughout the Federal Government until the early 1990's in response to the Government's quest of reducing the cost of doing business. EDI is an enabling system of protocol that powers the flow of information in a paperless environment by using an agreed upon standard between Government and Industry. Some of the advantages of utilizing EDI are that it provides for: a new and increased procurement business opportunities with the DoD and commercial market; improved efficiency as documents flow electronically, faster and less expensively than paper; increased overall quality via improved record keeping, fewer errors and less processing time; lower inventories required as well as improved accuracy in filing orders; and reduced mailing costs and faster billing and closeout of contracts. [JEPCO, 2001]

Businesses have the option of implementing and using EDI in a couple different ways. The first way is that businesses can sign up for an on-line EDI service (recommended for businesses with fewer than five transactions per month). An alternative is to purchase EDI software in conjunction with utilizing a Value Added Network (VAN). A VAN is a third-party communications company that provides the skills and expertise needed to provide EDI services to trading partners. While on-line EDI service can cost \$20 per month, VAN service can consist of a variable or fixed cost schedule. These costs are in conjunction with the EDI hardware and software that may be required. [JEPCO, 2001] As of 2002, more than 300,000 organizations use the 300+ EDI transaction sets to conduct business. [DEBPO, 2002] Due to the costs of implementing and/or utilizing EDI-based VANs, many private companies, such as transportation company, J. B. Hunt, are moving some of their customers off expensive EDI networks and on to the web-based networks. J. B. Hunt Company expects to save over \$12,000 per week by moving just a few of its customers away from EDI transactions onto web-based transactions. [Karpinski, 2001] A company can spend tens of thousands of dollars, and sometimes hundreds of thousands of dollars implementing a full-blown EDI system in their organization.

2. Federal Acquisition Computer Network

The Federal Acquisition Computer Network (FACNET) was developed and implemented as a result of Title IX of FASA 1994, to provide a single face to industry and interoperability within the Federal sector. FACNET was implemented to promote EC for purchases between \$2500 and the Simplified Acquisition Threshold (SAT), and enabled Federal agencies and vendors to conduct business in a standard way. FACNET was developed to: inform the public about Federal contracting opportunities; provide the ability to enable solicitations and electronic receipt of responses; outline details of Government solicitations; permit electronic submission of bids and proposals; facilitate responses and questions about solicitations; provide public notice of contract awards; issue orders where practicable; make payment to contractors by bank card, electronic funds transfer or other automated means; and allow the electronic interchange of procurement information between the private sector and Federal Government among agencies. [EC/EDI Fact Sheet]

Problems. Despite its intended purposes, FACNET has had problems. Some procurement professionals have found FACNET to be ineffective and unusable. According to an Office of Management and Budget (OMB) / Office of Federal Procurement Policy (OFPP) assessment of current EC activity in procurement:

Technical and architectural problems aside, one of the most significant factors hampering FACNET's effectiveness is its general incompatibility with the two buying techniques used most frequently by agencies to make small purchases – especially between \$2500 and \$25,000 (which represents the bulk of transactional activity to which FACNET was intended to comply). For individual purchases in this range, agencies typically use a “three-quote” process, where buyers, based on their knowledge of the local trade area, match agency needs with competitive small businesses and issue purchase orders on the basis of three telephonic quotations. For high volume buys, agencies often award indefinite-delivery, indefinite-quantity (IDIQ) contracts, or establish BPAs and place orders there under using simplified techniques for conducting commercial-style competitions among contract holders. These practices provide simple, cost-effective, and efficient methods of taking advantage of competitive pressures to meet small dollar needs.” [OMB/OFPP, 1998] FACNET was not designed to facilitate either of these buying practices.
No quote marks

Another problem identified by the Department of Interior (DOI), which has used the FACNET architecture since 1995, was the observance of an increase in the number of cases where vendors shipped the wrong product or products that did not meet the agreed upon requirements via FACNET orders, compared to transactions that took place in the local trade area using the three-quote method or by placing orders through an Indefinite Delivery, Indefinite Quantity (IDIQ) contract. [OMB/OFPP, 1998] This resulted in the DOI and other agencies utilizing other EC systems that were more compatible and more enabling to order via IDIQ contract three-quote buying or order placement. Web-based software and local area bidders lists were the main alternatives turned to. Electronic catalogs were utilized for large volume purchases. [OMB/OFPP, 1998]

Other reports indicate that FACNET resulted in lost, late, and duplicate transactions and network interruptions resulting in delayed procurements. This resulted in vendors faxing and phoning their quotes in addition to transmitting them through FACNET to ensure receipt. This can result in lost business opportunities and additional transmission fees paid to VANS, which are key components to FACNET infrastructure. Fees for VAN service can range from \$70 to several thousand dollars monthly for VAN service alone. [GAO, 1997]

FACNET benefits realized to a great or very great extent, as reported by Federal Agencies, are shown in figure 1 below. As per the GAO report from which this figure was taken, these results did not differ substantially for the DoD and its components, compared with the civilian agencies – which use FACNET much less than the DoD. As figure 1 below shows, the agencies ranked increased productivity, saved time and saved money lower than other benefits. However, it is these benefits that the DoD has been striving for. Note that the reported benefits that ranked lower (saved money, saved time, higher productivity) are the benefits being sought after in today's IT/e-procurement environment.

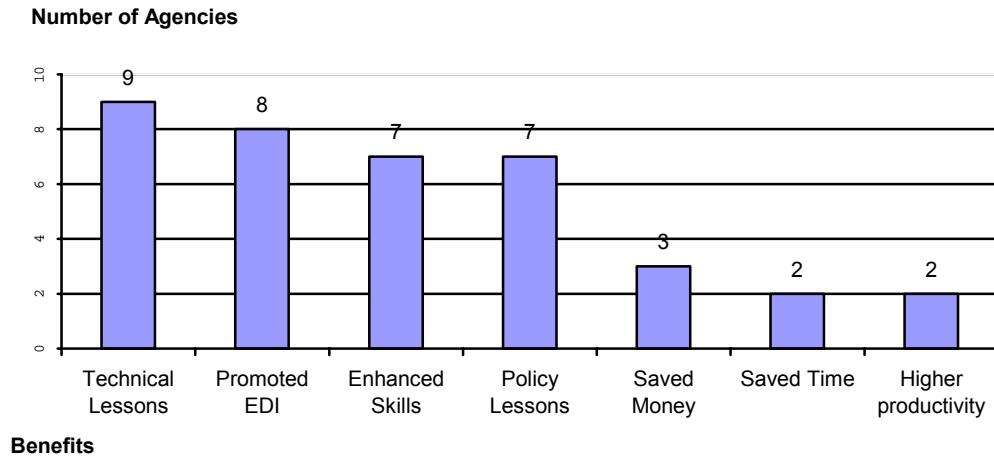


Figure 1: Reported Benefits of FACNET Realized by Federal Agencies
From Ref. [GAO, 1997]

Table 2 shows the responses concerning future use of various EC tools or methods, including FACNET. The responses came from eighteen respondents out of four major buying activities and seventeen Federal civilian agencies' EC program managers and comparable agency officials solicited on information and observations on FACNET implementation. The respondents responded to questions concerning future use of various EC procurement tools, obstacles to FACNET implementation, and benefits of using FACNET. [GAO, 1997]

Question: To what extent do you expect these EC "tools" to be important to your agency through 1999?	To little or no extent	To some extent	To a moderate extent	To a great extent	To a very great extent	Do not know	Total
A. FACNET	0	4	4	4	3	2	17 ^a
B. Some Alternative Government EC Solution	2	3	3	1	4	4	17 ^a
C. Internet	1	2	3	4	6	1	17 ^a
D. Agency-Unique System(s) or Architecture	10	0	2	2	0	3	17 ^a
E. Your agency's Electronic Bulletin Board	8	1	2	2	1	3	17 ^a
F. Electronic Catalog	1	0	7	4	4	1	17 ^a
G. Other	0	0	0	0	2	0	2 ^b

^a One agency did not reply to this question.

^b Agency officials not required to respond

Table 2. Responses Concerning Future Use of Various EC Tools
From Ref. [GAO, 1997]

As shown by Table 2 above, five years ago when this survey was taken, the respondents did not see any significant indication that FACNET would be important at their agency through 1999. Table 3 is the respondent's assessment of the extent each of the direct/indirect benefits that has been or was being realized in their agency from Federal efforts to implement FACNET. This table provides in tabular form, the results shown in figure 1, and shows that increased productivity, saved time and saved money lower than other benefits obtained through the use of FACNET.

Question: To what extent is each a direct/indirect benefit that has been or is being realized in your agency from federal efforts to implement FACNET?	To little or no extent	To some extent	To a moderate extent	To a great extent	To a very great extent	Total
A. Saving Money	7	4	3	1	2	17 ^a
B. Reduced Processing Time	8	3	4	1	1	17 ^a
C. Increasing competition/small business opportunities	5	5	2	3	2	17 ^a
D. Better management information	10	3	2	1	0	16 ^{a,b}
E. Improved payment process	13	2	0	1	0	16 ^{a,b}
F. Increased productivity of agency personnel	8	4	1	1	1	15 ^{a,c}
G. Policy lessons learned that will likely benefit the government in the future	4	3	3	5	2	17 ^a
H. Technical lessons learned that will likely benefit the government in the future	2	3	3	5	4	17 ^a
skills, or abilities of federal personnel that will likely benefit the government in	2	2	6	4	3	17 ^a
J. Fostered better cooperation and/or coordination between the EC and acquisition organizations	5	6	4	0	2	17 ^a
K. Forced or encouraged federal agencies to better manage EC efforts	3	4	4	2	4	17 ^a
L. Promoted EDI in the government	1	7	1	4	4	17 ^a
M. Other	0	0	0	0	2	2 ^d

^a One agency did not respond
^b Agency officials not required to respond
^c One additional response was marked "unknown"
^d Agency officials not required to respond

Table 3. Responses Concerning Benefits of FACNET
 From Ref. [GAO, 1997]

Procurement officials from several agencies have found FACNET to be unsuitable and have noted other more economical and user-friendly alternative purchase methods to use instead of FACNET. These alternatives include (1) ordering against electronic catalogs, (2) GSA Supply Schedules/GSA ADVANTAGE!, and (3)

Government-wide IDIQ contracts. These officials found web-based technologies to be better EC options than FACNET. Reasons included easier accessibility, fewer technical limitations, and lower operating costs to implement and use.

3. Standard Procurement System/PD2

At one time, it was determined that the DoD had seventy-one major information acquisition projects or “smaller” system acquisition and modification projects belonging to numerous organizations. The Standard Procurement System (SPS), now called Procurement Desktop-Defense (PD2) is just one of those programs. Developed and implemented in 1994, it was intended to replace 70-80 existing programs in addition to providing the end-to-end financial model. [Lieberman, 2002] PD2 is a robust, windows-based program that supports all phases of the Defense procurement process, from requirements definition and Pre-Award activities, to award, administration and closeout. PD2 includes the following functionalities:

- On-line DD and SF contracting forms
- Minimized duplicate data entry
- Accessibility to various standard support functions such as on-line Commerce Business Daily (Now FedBizOpps) announcements, milestone plans, checklists and other procurement documentation.
- The ability to route, review and approve procurement documents electronically.

Problems. Despite many improvements in the SPS software program over the years, the program still contains numerous problems. A web-based survey of selected personnel from a population of SPS 4.0 users at 534 DoD procurement sites resulted in some praise towards the program but also identified various problems associated with SPS resulting in high user dissatisfaction. Some of the survey results indicated that:

- 86 percent stated that that SPS was available most of the time.
- 64 percent of the respondents stated that SPS had not substantially contributed to the DoD goal of paperless contracting.
- 61 percent of the respondents preferred a procurement program other than SPS.
- 51 percent of the respondents stated that productivity had not increased since the last version was implemented.

- 46 percent of the respondents stated that the number of workarounds had increased.
- 27 percent of respondents licensed to use SPS V 4.1 had not used it due to the lack of functionality to perform their job or SPS was not needed to perform their job. It was estimated that department agencies spent \$2.1 million for licenses for users who could not or did not use SPS. [Lieberman, 2002]

Additional information indicates that the SPS program has been slow towards its implementation commitments. For example, at the time of the report, SPS had only completely replaced two procurement systems vice the 76 it was intended to replace. In addition, the DoD was not aware of the cost savings associated with the replacement of those two legacy systems with SPS. Further data indicates that the DoD now plans to retire only 14 legacy systems with SPS vice the 76 originally intended. The same information indicates that the DoD is unsure of the extent of user productivity increase from implementing SPS. The reason for this uncertainty is because performance metrics were not implemented. [GAO, 2002]

Further, according to a DoD IG report, as of December 2000, SPS was used by 16,207 users at 745 sites, but was expected to serve 43,000 users at 1100 DoD procurement sites by the end of FY 2003 [DoD IG, 2001]. This leaves 26,793 users uncovered. Additional functionality problems identified include: inadequate report generation capability for accurate management data resulting in the use of legacy systems as a workaround; inadequate electronic transmission functionality also resulting in manual workarounds; inadequate historical data access for contractor and contractor performance through on-line past performance histories; inability to easily view and search historical data resulting in the need for an independent and enhanced search and views capability. In summary, the user community remains dissatisfied with SPS as it requires more steps and is slower than their legacy systems. [DoD IG, 2001]

4. Central Contractor Register

As of June 1998, per DFARS Subpart 204.7300, all contractors accepting payment via other than the Government purchase card and wishing to do business with the DoD are required to be registered in the Central Contracting Register (CCR) in order

to receive contract awards from the DoD. Registering with CCR automatically registers a vendor with every defense agency and is the single source from which the DoD receives business from all contractors.

The purpose of registering with the CCR is to allow a vendor to register only once to do business with the DoD or any other Federal agency that uses the CCR. After initial registration, vendors are required to keep their vendor data updated annually and as changes occur. The CCR is the single source from which the DoD receives business profile information on all contractors in order to improve accuracy of vendor information on contracts and especially to expedite invoice payment processes. Ninety percent of all electronic payments made by the DoD are done using the information found in the CCR. The DoD requires vendors to register with the CCR prior to awarding any contracts, basic agreements, basic order agreements, BPAs and payment of goods and services. [DEBPO, 2002]

If items are purchased via a Government charge card, the vendor does not have to be registered in the CCR as the CCR is mainly a database for centralizing EFT payment information for vendors. In addition, not all agencies require registration in the CCR. The DoD is the largest agency that requires registration. The Department of Treasury and NASA, while not as large, also require registration prior to conducting business with those agencies. The GSA does not require registration in the CCR. [Selbee, 2002]

As shown by Figure 2 below, the number of vendors registered with the CCR has grown from 22,000 in 1997 to 163,000 in 1997 to over 202,000 as of August 2002 [CCR Website and GAO, July 2000]. To make this one-time registration process easier for vendors, improvements have been made resulting in a decrease in registration time, which has decreased over the years from 30 days to 2 days. [GAO, July 2000]

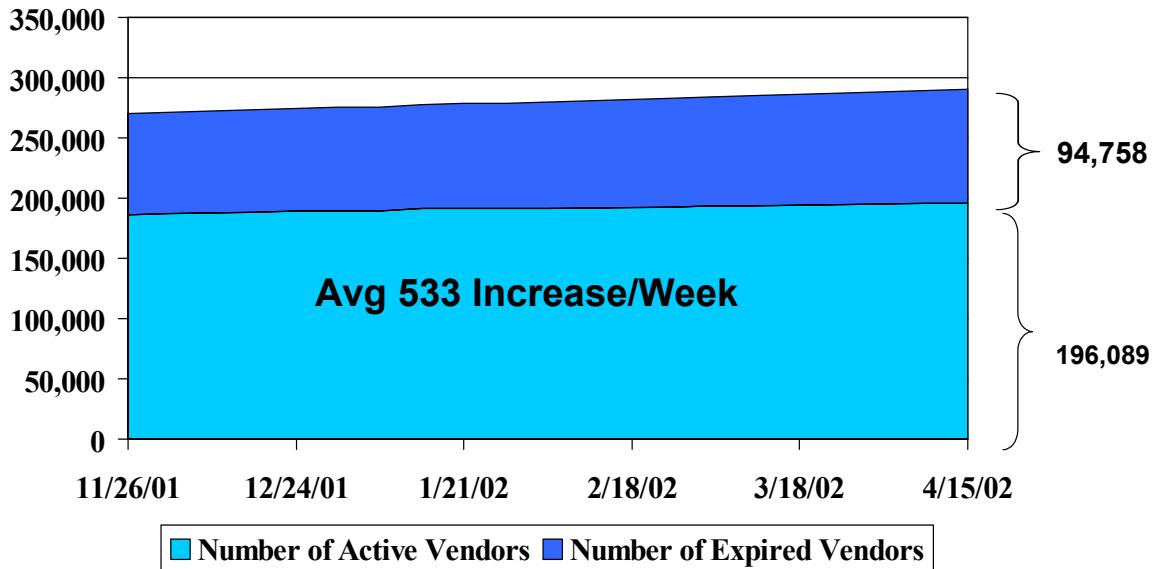


Figure 2: Number of Vendors Registered in the CCR

From Ref: [CCR Email, August 2002]

5. GSA Advantage!

One of the GSA's efforts to improve the Federal acquisition process was the development of an on-line acquisition/procurement system called GSA Advantage!, which is considered the premier on-line procurement source. With Advantage!, GSA uses Internet technology to give agencies on-line access to goods and services of over 8,000 vendors. Advantage! also allows for the submission of electronic Requests for Quotations (RFQs) for products and services and has an enhanced search and inquiry capability, making it a valuable market research tool for comparative purposes. [Perry, 2002]

GSA Advantage! is basically set up as an electronic mall (EMALL) where buyers search on-line listings, compare prices and then purchase these items on-line. GSA Advantage! sales in 1999 were \$85,687 million and \$124,892 million in 2000 [GAO, Dec 2001]. Ordering from Advantage! has many benefits including: ensuring the vendors you purchase from and your purchase itself meet all FAR requirements, greater efficiency in

the procurement process, free membership for vendors and users, easy access to mandatory source vendors, ready comparisons, recent order history, and the ability to browse, research and buy products from vendors that are part of GSA's Federal Supply Schedules. In addition, Advantage! includes an address book where members can store ship-to addresses, allows members to personalize their Advantage! home-page, and offers vendor support 12 hours a day, five days a week. Users shop on Advantage! and are then able to save their "shopping carts" and give others ready access to them by e-mail for approval or purchase. [GSA Advantage Website, 2002]

By searching on the Advantage! website, users avoid having to search paper catalogs for products and services, waiting for verbal or fax quotations and manually placing orders. Fees are paid by vendors on a per order basis to cover operating costs [Laurent, 2000]. Currently, GSA Advantage! encounters 35,000 transactions daily while providing access to more than 2.4 million products and services from over 8000 vendors holding GSA schedules. [GSA 2001 Ann Rpt.]

Problems. Despite its success, GSA Advantage! has some shortcomings. Vendors voicing their concern with the way GSA Advantage! is set up resulted in a GAO audit, which identified four main concerns. First, the Federal Supply Schedule (FSS) process, required for vendors to sell items through GSA, requires vendors to supply too much detailed product information leading to duplication of the vendors' own websites. Second, it takes too long to place product information on the Advantage! Web site. This results in orders being out of date when vendors receive them. Third, compared to the amount of time and money vendors put into Advantage!, they receive a relatively low return. Finally, sales volume is the most pressing problem, particularly among the IT schedules. Overall, FSS brings in more than \$10 billion in IT sales per year. However, in fiscal year 1999, the 2000 schedule vendors on Advantage! had only \$86 million in sales and as of May 2000, totaled only \$64 million. [Frank, 2000]

Other vendors have expressed a desire for Government purchasers to order their products the same way as do their private sector customers. With their private sector customers, vendors maintain their own sales database for products and services vice having GSA maintain their sales database for Government multiple award contracts.

Also, private sector customers purchase products and services by logging onto the vendor's website directly and place orders and are void of the requirements associated with ordering through Advantage!. Vendors claim that allowing this "private sector" process, GSA would benefit from reduced overhead of maintaining large databases and the numerous EDI transactions that accompany it. [Bass, 1998]

As of 1998, GSA used centralized architecture, which required vendors to send updated product and pricing information each night to the agency. To alleviate this requirement, GSA was testing a new XML-based program called WebMethods that may enable the agency to automatically grab information directly off the vendors' website.

Although perhaps not a "problem" for Federal users, with few exceptions GSA Advantage! is not yet available for use by State and Local Governments. The ability for State and Local governments to utilize GSA schedules contracts and GSA Advantage! may significantly increase on-line purchasing, resulting in further reduced product and service costs from increased sales volume.

6. Electronic Mall/Electronic Catalog

E-Catalog. Electronic catalogs (E-catalogs) are on-line versions of paper-based catalogs that provide product information such as product/service description, price and other features. Many e-catalogs are pre-established contracts with vendors that buyers can electronically browse and place orders under, and is a means for buyers to identify and order goods from multiple agencies. A buyer using a computer and a web browser searches e-catalog products on-line. In many cases, the vendors' product catalogs are placed on a host server. Under this situation, vendors must initially send and routinely update their product information in the correct format to the host server. In some cases, a distributed architecture is used in which vendor catalogs are located at different physical locations but the catalogs themselves are presented to the buyer as if they were in one place.

Utilizing e-catalogs has its advantages, which include improved market research capability resulting in a greater awareness of products and services available, comparison shopping thereby facilitating best value buying and e-catalogs also make the buying and

paying process easier, more responsive and efficient while shortening order cycle times. Through utilizing e-catalogs, the Government is basically adopting commercial market practices and advantages. [Mitchell, 1999 & OMB/OFPP 1998] The DoD has initiated several on-line stores that use e-catalogs. These initiatives include the DoD EMALL, the Army's AMart, the Air Force Country Store and GSA Advantage!.

E-Mall. An electronic mall (EMALL), such as DLA's DoD EMALL, basically consists of multiple electronic catalogs and stores, which are accessed on-line by customers. The DoD EMALL, established in 1998, helps purchasers find and electronically acquire off-the-shelf goods and items from the commercial marketplace and Government sources. The EMALL parts and supplies corridor provides over 3.5 million National Stock Number (NSN) items from DLA and 6.5 million line items available from over 50 commercial vendor e-catalogs with up to 70 vendors catalogs in the process of registering with the EMALL [Zimmerman, Sept. 2002]. As of September 2002, there were over 8,000 registered users [Zimmerman, Sept 2002]. Starting in October 2002, the Army will make it mandatory for Army agencies to buy office supplies on Army established BPAs through the EMALL [Zimmerman, Sept 2002]. This will significantly increase the number of commercial e-catalogs available on the EMALL website. The DoD EMALL sales trend data from fiscal years 1998-2002 are provided in Figure 3 [Zimmerman, 2002].

DoD EMALL Monthly Sales FY 99-02

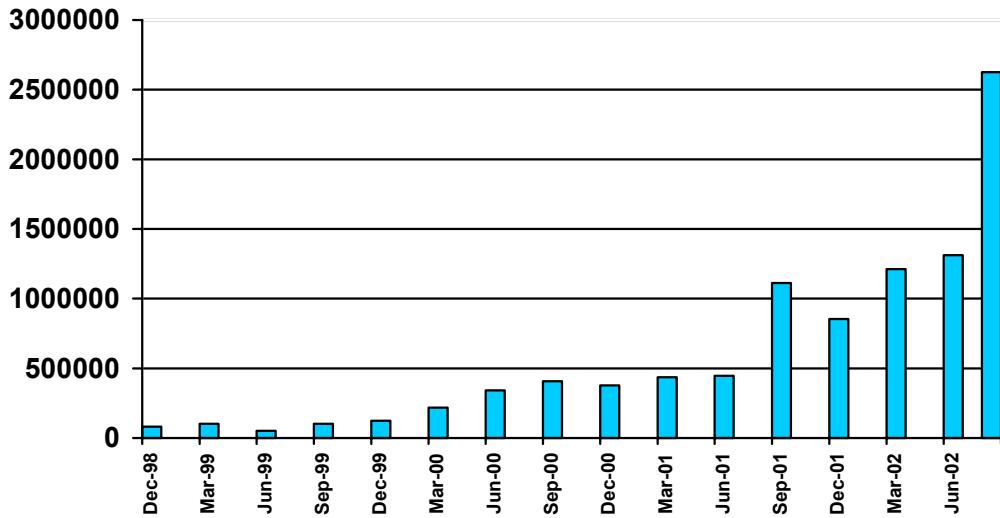


Figure 3: EMALL Monthly Sales for FYs 99-02 [Zimmerman 2002]

Currently, EMALL is piloting several additions to EMALL, which may significantly boost their on-line sales. One pilot includes service contract partnering with Naval Facilities Command for housing services contracts. Future service contract features will enable collaboration between housing managers, contracting officers and contractors on services that are not prepriced. Army BPAs will also be available through the DoD EMALL in the near future. The DoD EMALL is also working with the Naval Supply Systems Command (NAVSUP) and the Navy One Touch Supply Program Office to develop a single sign on capability allowing users already logged on to One Touch to link directly to the DoD EMALL without having to log on again. [Zimmerman, 2002] The EMALL provides information on products such as prices and availability as well as delivery options for items in the DLA inventory or products and services form participating vendors. Customers are able to shop for items by categories for items including reutilization, clothing, medical, subsistence, IT, automotive and rail, facilities and construction, and hardware. Customers can conduct their search by browsing the part number, name, distributor's catalog number, or keyword.

Other EMALL features include advanced searching, saved shopping carts, express shopping lists, order management, regional EMALL, payment options and business objects. Customers can search the EMALL seven different ways and shopping carts can be passed from one user to another, which allows a shopper to create an order cart or purchase. The DoD EMALL's express shopping function allows customers to design stores of frequently used items for easy re-ordering. The Business Objects function is a software program that allows for the gathering and filtering of information within the EMALL database and allows for customized reports on all sales data. Reports are available upon request. [DoD EMALL]

The E-mall also facilitates market research by making it easier to locate and compare products based on quality and price. Additional information such as product quantities and delivery time frames is also available on the DoD E-mall. The DoD E-mall also identifies Javits-Wagner-O'Day (JWOD) program items, environmentally friendly items and hazardous material items. [OMB, 1999] In addition to providing one-stop visibility for ordering from DoD electronic catalogs, the e-mall provides one-stop visibility for order status [DoD EMALL Projects].

In FY 2000, vendors reported \$178 million in DoD EMALL purchases, three times the amount purchased through the E-mall in 1999. Approximately 12 million items from 316 vendors are available through the DoD E-mall directly or through direct delivery contracts and pre-negotiated contracts that are connected to the EMALL system. [Murray, 2001] The largest E-mall customer is the Navy, which bought 42% of the goods and services sold through the E-mall in 2001. The Air Force followed with 16% of the sales, and civilian agencies combined totaled 20% of all buys last year with the Department of Interior and Department of Justice being the largest civilian buyers. [Miller, 2002]

Recent improvements to the DoD EMALL include a new search capability that allows the ability to search using synonyms, spelling deviations and other advanced searches. EMALL rebuilds its catalogs each night vice having the search engine go out into the Internet for information from the vendors catalog. In addition, EMALL has added a material receipt acknowledgement function that sends buyers a message and

solicits feedback. [Miller, 2002] EMALL offers a number of ways it can retrieve catalog information for users while still ensuring a uniform view of the data when the user sees it. EMALL can access the supplier's working data from their database via the ePorttm technology that forms the backbone of the catalog searching capabilities, suppliers can hire a third party to host their eCatalog and EMALL will then use the ePorttm to access the data where it resides, or EMALL can link to other websites in a couple of different ways. [Zimmerman, September 2002]

Problems. One problem with the EMALL that has been noticed is that sales continue to be lower than that desired by the DoD. Fiscal year 1999 sales totaled \$2 million compared to its \$4.26 billion estimated target market at the time. One problem with the EMALL that might contribute to the low sales volume is that it does not carry the range of items envisioned. As of March 2000, the mall carried only a small portion of commercial items, which consisted of only 249,000 of the mall's 2.3 million items. Some DoD officials attribute this to the belief that some vendors, especially small businesses, are reluctant to participate as they do not want or cannot incur the cost of standing up and maintaining an Internet-based catalog system and meeting the EMALL's technological requirements. Another identified problem is that customers did not feel that the system was user friendly and that the system lacked the power to conduct effective cross-catalog searches. [GAO, July 2000]

Catalog Interoperability. Despite the growing number of both Federal and non-Federal e-catalogs, there is concern with the lack of interoperability. Having to search multiple sources and make intelligent comparisons takes time and effort. On the vendor side, having to maintain multiple product and service catalog formats and interfaces can also be time consuming and very expensive. Interoperability of the e-catalogs would result in cost savings for the vendors selling their products, time savings for both the vendor and buyer as well as reduced prices through increased competition, buyer awareness, and less overhead costs. [Mitchell, 1999] Other issues indicate a need for less cumbersome searches, greater clarity in indicating currency of information, and greater ability to conduct comparisons between multiple catalogs.

7. Reverse Auctions

Reverse auctions are an online event where a buyer indicates his need for a product or service on-line and multiple sellers compete against each other, submitting subsequent and multiple lower bids on-line, to provide the product or service, thereby driving down the price. The lowest bidder or “best value” bidder receives the request. Unlike traditional competitions, reverse auctions allow bidders to submit multiple bids, lower than the previous, if so desired. Reverse auctions provide dynamic real-time competition, which can translate into savings that reflect true market pricing, web-enabled capability to purchase commodities and services, autonomous participation to other bidders, ability to capture value sourcing data including buying and pricing patterns, reduced acquisition cycle time and competition. Reverse auctions can either be of the “hosted” type where a contractor provides products and services necessary to conduct the auction on behalf of the ordering agency, or can be of the Desktop type, where the contractor provides software subscription, help desk, and web-based tutorial training to conduct the event themselves. [GSA Website]

Reverse auctions innovation is new only to the business-to-government arena. Business-to-business industries have been using reverse auction technology in areas such as purchasing automobile parts. In 1998, the FAR Part 15 was rewritten to allow the consensual disclosure of a contractor’s bid and encourage the infusion of “innovative techniques into the source selection process.” [Harris, 2001]

On July 25, 2002, Orbis Online was awarded a five-year GSA contract to provide online reverse auction to the Federal Government. Orbis will provide both hosted and desktop (self-service) reverse auctions. Orbis is not new to reverse auctions in the Federal Government. In 2001, Orbis successfully completed the first real-time reverse auction for Randolph Air Force Personnel Center, which resulted in a savings of almost one million dollars, and enabled the Air Force to purchase 833 state-of-the-art computers. The savings was determined by comparing the final price with prices offered on existing GSA schedules. [Orbis, 2002]

There is a mix of opinions as to whether reverse auctions work and save enough money to warrant its continued use. During a recent lecture at the Naval Postgraduate

School, LCDR Roger Lord, of FISC Norfolk, indicated that he has utilized reverse auctions on three different occasions. Two of the three events did not result in any significant savings but was administratively easier to conduct over legacy methods. The third reverse auction resulted in a savings of approximately \$50,000. [Lord, 2002] In contradiction, U.S DoD officials claim reverse auctions conducted between April and November 2000 yielded a 30 percent savings on average [Ashley, 2002].

Reverse auctions do not always save time. While reverse auctions do streamline the acquisition process by eliminating the cost of producing multiple proposal revisions and time-consuming negotiations, the pre-negotiation preparation time remains the same, but in some cases takes longer than traditional methods [Ashley, 2002].

Despite the benefits of reverse auctions such as real-time market pricing research, pricing trends, and up-to-date auction information, small businesses are still complaining that reverse auctions are shutting them out of competition. As with implementing EDI, FACNET and other systems, reverse auctions require investment in technology (hardware and software) to participate. Some small businesses cannot afford the added expenses of the required hardware and software.

GSA's Federal Technology Service (FTS) has offered private reverse auctions since 1999 at Buyers.gov. Buyers.gov has produced considerable savings. For example, DFAS saved 21 percent - \$2.2 million when the agency bought computer products off Federal Supply Schedules through reverse auctions. [Matthews, 2001]

C. EC TOOLS IN STATE/LOCAL GOVERNMENTS

Unlike the Federal Government, there is no central e-procurement authority for State and Local Governments. It is left up to each State and Local Government to develop and implement its own policy regarding e-procurement. Therefore, a number of State legislatures have passed laws mandating and enabling e-government. Local Governments are proceeding the slowest and many large cities offer only basic websites and few, if any, services. Recently, seeing the benefits of EC and e-procurement, many State and Local Governments have started moving their businesses on-line. Many State and Local Governments are starting to provide more information on-line. Most States

now have procurement websites that offer vendors the opportunities to register and receive solicitations, invitations for bids and requests for proposals. In its 2001 NASPO survey, eleven states said they automated procurement systems to provide integrated EC. At the time, procurement notices and solicitations were distributed in hard copy in twenty-three states, by e-mail in sixteen states, by fax in eight states and by Internet posting in seven states. [Wilkinson, 2001] It is estimated that all but eight states will be using some form of e-procurement by 2003 [Terry, 2001].

Implementing e-procurement within States has the potential for significant savings. In a report recommending that the state of Texas implement e-procurement, the Texas Comptroller stated, "Typical estimates of potential savings for companies adopting e-procurement systems range from 2 to 40 percent. The return investment averages 300 percent and all investment costs can be recovered within 12-18 months", [Rylander, 2000]. Most states using an e-procurement system use a self-funded method, a state-funded system, or a mixture of the two. A self-funded system is a system that charges the users (vendors and/or buyers) of the system vice state funds.

Two of the states that have implemented successful e-procurement programs are Maryland and Virginia. Their systems, like other States, have enabled them to discard the decentralized procurement process where each agency, and sometimes internal departments, used their own varying processes to purchase goods and services.

1. Maryland

Maryland began moving it's more than \$8 billion in annual state purchasing to the Internet with an innovative Government-to-Business/Business-to-Government no-cost project in March 2000. The system called "eMarylandMarketplace" allows Government Agencies to conduct business transactions with vendors in a paperless environment, producing savings for the State and Local Government Agencies and their vendors. The program includes over 60 State and Local Government Agencies and over 1,650 bidding vendors.

The program consists of State commodity contracts that are loaded as vendor maintained catalogs available to public and Government buyers. The program also

includes the ability to perform on-line bid tabulation, e-mail, enhanced approval processing, e-purchase orders, a bid lock-box, self-registration, and e-mail solicitation notification. The program is one of the first State e-procurement systems to utilize a self-funded model, which allowed the state to save millions in developmental costs. Further implementation and operating costs are recouped through vendor registration and a 2 percent per order transaction fee. Vendors choose from two subscriber levels at a cost of \$150 or \$225 annually, depending on the services the vendor desires. [eMarylandMarketplace Website]

Catalog Purchasing. The “eMarylandMarketplace” utilizes “iPlanetBuyerXpert” Online catalog for purchasing. This is very beneficial for vendors that have existing e-catalogs as it allows them to adapt their catalog to fit the “eMarylandMarketPlace” without additional software and hosting costs. For vendors that do not currently have a web catalog, the eMarylandMarketplace supplier enablement team will assist them in creating one in minutes. [eMarylandMarketplace Website] The number of vendor e-catalogs and vendor items available through eMarylandMarketplace has risen significantly since the program’s inception as shown by figure 4.

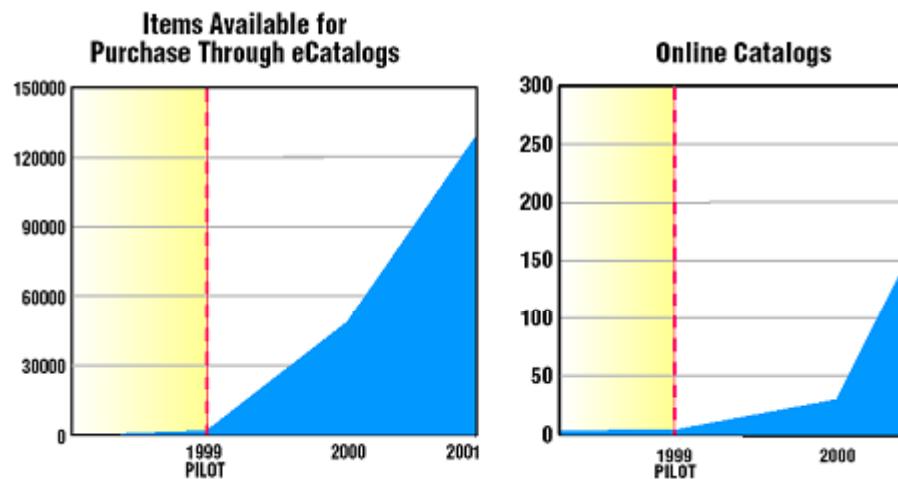


Figure 4: eMarylandMarketplace on-line e-catalogs
Ref [eMarylandMarketplace Website, 2002 Annual Report]

The “eMarylandMarketplace” also offers vendor Interactive Bidding. This allows the posting of solicitations and the ability for vendors to bid online. Vendors that have subscribed to “eMarylandMarketplace” can search bids online for opportunities, resulting in a savings of thousands of dollars in travel and submission costs for the vendor.

2. Virginia

Like Maryland, Virginia has also taken the plunge to move their \$5 billion in annual purchases of goods and services on-line. Through multiple executive orders, Virginia has also started to expand its ordering and delivery of products, services and other e-government initiatives through the Internet. Executive Order 65, one of the foundations for this initiative, directed the state’s Department of General Services to implement a statewide e-procurement system. In response, Virginia developed the “eVA” system. The “eVA” system allows state agencies to purchase public goods and services from state contracts, through e-catalogs, and through vendor websites themselves. Implemented in March 2001, the program had grown to include 433 vendors by April 2002 with catalogs registered on-line and 4,297 suppliers registered to sell their products and services through the system. [Wilkinson, 2001]

Streamlining the acquisition process across the entire state, “eVA” processed more than 3,500 transactions and \$22 million in orders in its first nine months. By using the “eVA” system, it is estimated that agencies will save up to \$145 in administrative costs on each transaction. Using a one-stop catalog approach, “eVA” allows the comparison of prices, encouraging competition and further reducing prices. For state agencies that do not or cannot implement a full-scale “eVA” system, the state has developed “eVa Lite”, a fast and easy way for Local Governments to join the online purchasing community. In Virginia, more than 40 Local Governments including large cities and small towns currently utilize “eVA Lite”. [Faucett, 2002]

“eVA” is funded by a combination of annual registration fees and a nominal per order fee. Vendors pay a service cost of \$25 per year or \$200 per year for premium service. In addition, vendors pay a one percent transaction fee for all orders placed and

received through “eVA”, with a \$500 cap for each order. User agencies can currently access over 200 catalogs in the “eVA” EMALL. [Atwater, 2001]

3. PublicBuy.net

Another e-procurement solution on the state and local level is “PublicBuy.Net”, which is currently being implemented by Maine, Texas and Idaho. “PublicBuy.Net” is a powerful e-catalog and e-procurement system that automates the competitive bidding process and contract administration in the public purchasing sector at the state and local levels.

“PublicBuy.Net” actually consists of three separate e-procurement programs that cover three main client bases: Government (local, state, federal), airports and schools (Publicbuylink, Airportlink and Schoolhouselink, respectively). The site is basically a one-stop-shop for organizations to purchase all of their products and services. These three fee-based systems increase efficiencies, increase revenues and increase access to the market. In addition, they provide an alternative to the traditional paper-based procurement process, streamline the requisition process by automating requests for bids and quotes, simplify product and price comparisons, and allows buyers to create and approve requisitions. [Jehle, 2002]

PublicBuyLink is a powerful intuitive e-catalog system as well as a bid/quote tool that provides e-procurement goods and services to local, State, and Federal Government organizations as well as vendors nationwide. The system works with all categories of national and regional suppliers enabling the buyer to purchase everything needed on-line. In addition, buyers benefit from aggregate purchasing opportunities when they become part of a nationwide network of Governments and benefits through increased purchasing power, resulting in increased customer service as well as lower prices.

PublicBuyLink utilizes an iCatalog module; a customized Internet shopping service that is based on public agencies’ existing vendor contracts. Appropriate vendor contracts are loaded for each state into the State’s customized iCatalog. [PublicBuyNet Website] In addition, the iCatalog module allows government groups to track vendor performance as well as access statewide purchasing reports. The PublicBuy.Net system,

which was designed by public procurement professionals to address the need of state and local governments, only requires a computer and Internet browser. This is a small investment compared to the savings in the elimination of up to 40 percent of the direct labor involved in the procurement process on the buyer and vendor side.

Texas anticipates up to 5,000 state and local employees will use the PublicBuy.Net system and expects over 1,700 vendor contracts with 170,000 items to be included in the states' iCatalog. In addition, Texas anticipates that over 13,000 registered vendors will be eligible to access the bid response system. [PublicBuyNet Website]

D. SUMMARY OF ISSUES

Despite the successes of the above programs and many other systems not mentioned, there are issues and obstacles in participating in on-line EC and e-procurement. Some of the issues were mentioned throughout this chapter particularly as they applied to small businesses. A reiteration of those issues and concerns include:

Cost. Cost is the most common and greatest impediment to implementing EC and on-line procurement. For many businesses, there are up front implementation costs, a lack of monthly cash flows for maintaining their sites and e-catalogs, and the uncertainty of an adequate return on investment. In a 1998 survey of 500 small business owners and managers, many believed that selling on the web would be important in the future. One-half of those surveyed indicated that the cost of implementing and maintaining a site is the biggest hindrance to selling on-line followed by a lack of technical expertise in maintaining a site (45 percent) and the cost of building a transactions-based site (36 percent). [SBA, 1999]

Expertise. A June 2000 report by the Organization for Economic Cooperation and Development on enhancing the competitiveness of small and medium-sized businesses, indicated that many small businesses lack the expertise to develop EC capabilities and cope with the many complex rules that accompany this arena. There are a lack of skills and ability to build EC websites, selecting designers and internet service providers and lack of knowledge in how to integrate EC into their business processes.

Many small businesses are unable to afford to recruit, train and retain such technical personnel.

Access. Small businesses, particularly in rural areas have difficulty obtaining high-speed, affordable Internet access that is sufficient for EC activities. Dial-up modem capability is the only means of communication for some businesses. Rural America has less broadband hi-speed, hi-capacity Internet connections. [GAO, Oct 2001]

Although a business may have adequate access and the technology to participate in EC and e-procurement, there are other obstacles to on-line Federal e-purchasing. Although there is a need and desire in the Government to conduct purchasing on-line and to electronically streamline every aspect of purchasing on-line, it can be said that there are too many systems out there to monitor for opportunities. The Federal Government has multiple websites listing contracting opportunities and related procurement information needed to identify business opportunities. For example, an August 2002 search for "Federal Contracting Opportunities" by the author of this text, provided links to over 1,000 websites identifying procurement opportunities. Many businesses lack the personnel and time needed to search the web.

For vendors, the effort required to participate in the various websites is extremely time consuming, particularly for businesses listing their e-catalogs on the many available sites. The process for posting listings on the many sites is inconsistent and time consuming. The many different sites require different formats and procedures. The need to maintain and update the many e-catalog formats may require some vendors to hire a third-party service provider. [NASPO, 2002]

Multiple Registrations. Despite the implementation of the CCR discussed earlier, vendors who want to conduct business with more than one Government office may still have to complete multiple registrations and profiles and provide redundant business information to each site in varying formats. Not all Government agencies require vendors to register in the CCR, thereby resulting in that agency's website's registration process being used. The administration has tasked agencies in 2003 to use the CCR as the single validate source of data on vendors contracting with the Government. [GAO, Oct 2001]

Technical data and drawings. There is concern over the problem of posting technical data and drawings on the web, as voiced by business assistance program officials and industry groups. Posting such items on the web can be difficult, frustrating, and time consuming. Procurement Technical Assistance Center (PTAC) and Electronic Commerce Resource Center (ECRC) officials point out that many small businesses lack the adequate resources to adequately utilize the web to upload and/or download required technical information.

E. CHAPTER SUMMARY

While the advances in EC and e-procurement in the Government continue to grow in exciting, interesting and challenging ways, many concerns remain. Federal, State and Local Governments are reaping benefits in procurement cost savings and reduced cycle time through the plethora of electronic systems in use and being developed. However, there remains a digital divide between those private sector users of the various systems and those that want to participate but are unable to. Many of the more common barriers to EC and e-procurement use were mentioned in this chapter. These common barriers will be compared against a new pure electronic system currently being developed. Although some of the issues may have been addressed and corrected in the applicable system(s), it is important to mention them as a “lessons learned” for future systems being developed. The new program will be analyzed against these issues to see if the electronic purchasing portion of this new program shows any improvement over legacy systems. If not, recommendations will be provided.

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IV. ANALYSIS

A. INTRODUCTION

Current capabilities of the commercial Internet marketplace appear to be adaptable to off-the-shelf supply and service purchases that the Government routinely makes. In addition, various Internet companies have developed electronic ordering, billing, shipping, and tracking systems that are superior to Government systems. Generally, when a Government activity wants to make a purchase, it turns to a purchase and contracting system that sometimes takes months to complete a transaction, with the majority of systems taking an inordinate amount of time. Although systems such as DoD EMALL have made significant improvements in use and functionality over the last couple of years, the commercial Internet web systems offer the Government the opportunity to further increase the speed and efficiency of its current procurement and finance systems.

Internet technology has proven applications in the acquisition/procurement environment. Commercial systems such as “eBay” and “Amazon.com” are just two of the more successful commercial Internet systems, which have the functionality sought after for Government procurement. However, the Government continues to attempt to automate and upgrade existing contracting systems and processes rather than create new methods for changing the character and nature of contracting.

This chapter introduces a new, pure, beginning-to-end electronic contracting and procurement program currently in development under the umbrella of the Naval Postgraduate School. The basic functions of this new program are discussed and compared to the issues and problems with current systems in use that were discussed in chapter three. All information on the new electronic system was obtained through draft Request For Proposal documents obtained from NPS and from a meeting between the prime contractor and NPS representatives on March 23, 2002.

B. THE PURE ELECTRONIC CONTRACTING/PURCHASING SYSTEM

The Naval Postgraduate School (NPS), a Department of Defense educational and research institution with a mission of investigating new contracting mechanisms and processes, developed a new electronic on-line contracting and procurement system. With the Department of Interior (DOI) as the contracting activity and program manager, NPS researched electronic ordering and delivery of supplies and services throughout the DoD, Federal, State and local Governments. The premise and intent of this new system is for the prime contractor to utilize commercial, mature Internet technology methods to facilitate the daily ordering, delivering and billing of supplies and services to Government customers. This process is intended to result in improved efficiency and cost reduction.

One primary reason for using a commercial alternative is that billing and ordering capabilities of current commercial Internet companies exceeds the current capabilities of DoD contracting and finance systems. One goal was for NPS to avoid generating yet another private label system for the Government and instead, adopt a commercial system so that the Government can merge into the commercial world capability, resulting in the capability of the prime contractor to sell the product capability commercially.

1. System Functionality

NPS students, who had a background and experience in contracting and/or contract administration, determined the functionality desired in this new system. The students developing this new program had previous experience using some of the programs discussed in chapter three such as the DoD EMALL and GSA Advantage!. The students' experiences and backgrounds defined the desired capability of this new program. A brief discussion of some of the more basic functions of this new program is discussed.

a. Electronic Storefront

The main focus of this thesis is the electronic storefront function of this new program and how it relates to issues and concerns with current storefront on-line

programs in use. This function is intended to have all products and services available to buyers through this electronic storefront.

(1) Catalog System. The intent is that for the electronic storefront function of the new system the prime contractor will centrally store vendor e-catalogs, which can then be searched by buyers for purchase of products and services. Vendors will be able to submit their e-catalogs to the prime contractor, and to reflect product information changes as required. Buyers will be able to use standardized nomenclature to search the catalogs. Once an item is selected and the funding approval received from the ordering office, the order will be sent to the vendor via the prime contractor. Shipment will then be made to the buyer.

(2) Vendors. It is expected that all vendors registered through the CCR that have e-catalog capability will be included in this system. In comparison, systems like GSA Advantage limit selling on GSA Advantage! to those vendors that are on the Federal Supply Schedule. Vendors registered through the CCR that do not currently have e-catalog capability may use this system to sell their products or services if they become e-catalog capable. By listing all the e-catalog capable vendors known to the Government contracting system, the system can leverage the large volume of purchases of commercial supply items and services within the Federal Government. As discussed in chapter two, there are currently over 202,000 vendors registered in the CCR. However, not all of those registered vendors have e-catalog capability.

(3) Set Asides. Socio-economic set-asides in Government contracting are requirements within the contracting community to award contracts to small and disadvantaged companies. The electronic purchasing system will identify these socio-economic companies in a readily identifiable fashion via nomenclature and/or symbols. For example, 8A firms may be identified with a red star, women-owned firms with a blue square, hub-zone firms with a green cross, small businesses with yellow circle, etc. When a Government buyer initiates an acquisition, the buyer will have the ability, using a filter, to restrict the search parameters to socio-economic firms, a particular class of set-asides, or perform an unrestricted search with the socio-economic firms included. This function will support contracting offices throughout the Government buying community in meeting their set-aside goals. Vendor set-aside

information will be incorporated into the system using data from the CCR and/or Small Business Association (SBA).

(4) Vendor Past Performance Data. As per the FAR, contracting officers are required to provide past performance data on contractors for purchases of \$100,000 and above. However, the concept of recording vendor past performance is rarely completed or is incompletely performed due to the administrative burdens associated with capturing and collecting the data. This new system will accommodate that requirement and will go one step further. Initially, in order to capture all vendor/contractor performance for purchases, the buyer will be prompted upon delivery of the product or service to input into the system their satisfaction with the contractor using a one to five scale. A grade of one (unsatisfactory) or a five (excellent), will require the buyer to enter a narrative. However, the buyer will have the ability to enter narrative data regardless of the numerical grade given the vendor and the vendor will have the capability to respond to any narrative made for or against them. Past vendor and buyer comments and grades will be made available to all future buyers.

In comparison to normal past performance information on a particular supplier, the system provides summarized chart information on the dominant suppliers and commodities. A buyer is able to view who is selling a commodity, how many times it has been sold, who has been buying it, and the past performance information available to support the entire process from purchase through end use.

(5) Market Research. Market research is required in all Government contracting actions per Part 9 of the Federal Acquisition Regulation. Although this requirement is satisfied in most acquisitions, it is rarely conducted to the fullest extent possible due to the high administrative burdens. With this new system, an ordering officer will be able to enter a search for a particular item. Once found, the past performance information generated by all previous purchases will be made available as an average and the buyer will have the ability to access written comments. Database information on how many items that have been purchased from a particular vendor in comparison to all purchases should be available. For example, when purchasing an item, the top five vendors, in terms of volume, supplying that item will be visible in the form of bar or pie charts. This information provides a buyer with visible information as to which

vendors are successfully selling their items and what the vendor past performance numerical rating is.

The new system increases the knowledge base of contracting officers and customers. Through its databases, the system provides the information on all the purchases made by comparable buyers for comparable products for a detailed market research review. This database allows a buyer to make a fast, “educated” decision about a procurement action.

b. Historical Data

A unique function of this new program is the addition of user historical data. When placing an order, that user can see his/her historical purchases performed. In addition, the buyer can see what his/her predecessor has purchased in the past as well. The database will monitor all purchases made by “position” as opposed to the “person” in the position. This will accommodate ordering officers who transfer every two or three years. The successor will have complete access to the predecessor’s purchase database. An artificial intelligence component of the system will assist with recommendations based on the previous buyer’s purchases. It will also passively prompt the new buyer as to what products and/or services the previous buyer purchased at the end of the year. It will also indicate to the user who else has bought this item or service.

(1) Exercises/Operations. The same type of historical system support will be applied to exercises and contingency operations. The DoD routinely conducts repeat exercises/operations every year that require the same or similar products and/or services support. The new system will allow the buyer to link specific purchases to a particular exercise/operation, allowing the system to compile and maintain the database for that particular exercise/operation. Purchases from previous exercises/operations can be provided to the buyer and will even prompt the buyer if purchases from the last exercise have not been made. The administrative savings in this type of purchase are enormous. The entire database is available for analysts to determine future efficiencies. The entire purchasing system can be tailored to provide a complete picture of the expenses associated with the exercise, operation or contingency operation and allow for identification of operational and/or doctrinal changes. This would save

numerous man-hours and effort on behalf of the contingency operations personnel in researching the local vendor base and drafting ordering documents as the work would already be accomplished from the previous operation.

c. Template Service Contracts

By utilizing template service contracts embedded in the new system, the buyer can order the service from a particular contractor to start at a set date or the buyer can request proposals for firm fixed prices from several different vendors. All of this is done electronically saving valuable manpower, money and effort.

d. Auction/Electronic Exchange

The Auction/Electronic Exchange function of the new system allows for the disposal/exchanging of excess or ineffective property items through an electronic auction function. This function brings together the Government seller and commercial buyer in an efficient auction system that generates the highest return for the Government program manager. The system also, in turn, transfers the proceeds of the sale to the seller's account held by the contractor so that the money can be used, without fiscal year restraints, to purchase replacement like-items through the electronic storefront portion of the system. This transaction is allowed under United States Code, Title 40 – Public Buildings, Properties and Works, Chapter 10 – Management and Disposal Of Government Property, Subchapter II, Section 481 (c) - Exchange or sale of similar items, states:

In acquiring personal property, an executive agency, under regulations to be prescribed by the Administrator, subject to regulations prescribed by the Administrator for Federal Procurement Policy pursuant to the Office of Federal procurement Policy Act (41 U.S.C. 401 et seq.), may exchange or sell similar items and may apply the exchange allowance or proceeds of sale in such case in whole or in part payment for the property acquired: Provided, That any transaction carried out under the authority of this subsection shall be evidenced in writing. Sales of property pursuant to this subsection shall be governed by section 5 of title 41, except that fixed price sales may be conducted in the same manner and subject to the same conditions as are applicable to the sale of property pursuant to section 484(e)(5) of this title.

The auction functionality will consist of two major methods for auction disposal. A single system available for all to bid through, and a multi-location system where items are to be brokered to various auction systems depending on the type of item. The reporting system for funds produced will be clear and will identify the type of item disposed of so that a similar item can be purchased as a replacement. This is critical as the statutory authority for this type of transaction is limited to replacement of the item with a similar item.

e. Reports

The new system will utilize the database capability in conjunction with reporting capability to provide a better view of this Government purchasing system. All the information generated and inputted into the database will allow for the generation of reports. This system will automatically generate and provide ordering office information and reports to the contracting officer for accurate spending figures, which can also be used for the annual DD350 that currently must be processed manually by each contracting officer. Many other required reports will be generated in this new system as well. The benefit is that the system will automatically generate these tedious reports vice the contracting officer manually extracting and generating them.

Procurement Administrative Lead Time (PALT) data can also be extracted from the system and produced in a report format. PALT, a common metric for supplies, is extremely important for management as it helps determine and evaluate the efficiency and effectiveness of the supply procurement program.

f. Availability

Utilized as a Government Wide Acquisition Contract (GWAC), and unlike many other systems discussed in Chapter three that only allow DoD users, the intent is for this purchasing program to be available for use by all Federal, State and Local Government agencies. It is also anticipated that commercial purchases will be allowed through this new purchasing system. The intent of allowing commercial purchases is to increase the volume of purchasing, thereby further reducing product and service cost through increased volume and competition. However, it is realized that the Government

needs its data segregated from commercial purchases for reporting purposes. It is also anticipated that eventually the international community as well will participate in this new system.

g. Bulk Funding/Credit Cards

In commercial operations, credit cards are the primary method of funding. In Government purchasing operations, fund cites are the primary method (fund cites are a string of alpha-numeric characters that provide information about the origin and nature of the funding). The concept is that as a Government buyer makes a selection within the system and places it in an electronic shopping cart, that cart is transferred to a Resource Manager, who in turn provides a fund cite back to the buyer. The buyer then forwards the purchase list with the fund cite to the contractor. The contractor forwards the orders to the various vendors that in turn provide the goods or services to the Government. When the Government representative indicates that the transaction is complete, the contractor then makes payment. Some fund cites may be provided in bulk as opposed to the exact amount necessary for a particular purchase. These bulk funds will be registered in the system and orders processed against remaining amounts. The system will notify a bulk fund user of the declining balance.

h. Future Potential Capabilities

Utilizing a commercial format for this new system results in greater flexibility for incorporating additional functionality in the future. The following are suggestions of other capabilities that will likely be incorporated into the operation of the entire system.

(a) Stocking. This item refers to the ability of the system to see either the stock that a particular vendor may have available, or the stock that the Government has in its own inventory system. Make .5 tab

(b) Wireless Communications. Wireless purchasing is currently not used within the Government arena. However, the ability to expand into this area is greatly desired.

(c) Cost Contract Support. This is a concept that will be incorporated in the future. Many contracts within the Federal Government are cost contracts wherein the Government pays all the costs incurred by the contractor, plus a fee for profit. Under these contracts, the Government has a large burden in tracking the costs of the contractors. The intent is to have the contractor with the cost contract use the electronic purchasing system along with its database capability to purchase the items the Government is responsible for. This provides the Government with an immediate ability to see the actual expenses incurred and to directly fund them. This process will save money for the contractor and the Government.

C. SYSTEM BENEFITS

The World Wide Web (www) has introduced many new changes and opportunities, which have significantly broadened the scope and applicability of EC. The commercial world has taken advantage of this opportunity but the Government has grasped it with far less vigor. The new electronic procurement program helps implement the many changes in EC provided and directed under the NPR, FASA, FARA, and numerous committees and Executive Orders. The new system takes advantage of the www, encompasses all aspects of buying and selling electronically, utilizes EC to improve efficiency, streamlines the cumbersome procurement system, emphasizes the procurement of commercial products and services while preserving the concept of full and open competition, and expands the application of online procurement in the Federal Government to improve efficiency while reducing procurement costs. This is extremely important as Federal, State and Local Government spending on-line is expected to reach \$6.2 billion by the year 2005 [GAO, May 2000]. This new program is a step towards encouraging more businesses, especially small businesses, to participate in the Federal procurement process by widening access to procurement offerings. What benefits will the new system bring to the table? What makes it better than the systems currently in use? A list of some of the issues and concerns with the legacy systems discussed in chapter three follows:

- High costs of implementation and use (EDI, FACNET)
- Incompatibility with buying techniques (FACNET)
- Ineffective/Unusable – FACNET
- Transmission problems (lost, late, duplicate transactions) (FACNET)
- Rank low the ability to save time, save money and increase productivity (FACNET,SPS)
- Work-around programs preferred/used (EDI,FACNET,SPS)
- Not contributing substantially to goal of paperless contracting (SPS)
- Lack of functionality (SPS)
- Failure to replace legacy systems (SPS)
- Inadequate report generation capability (SPS)
- Inadequate historical data access and past performance (SPS)
- Too much vendor info required and duplication of vendors' own website (GSA Advantage!)
- Orders out of date upon vendor receipt (GSA Advantage!)
- Lower return to vendors compared to effort and money investment (GSA Advantage!)
- Lower than desired sales/sales volume (GSA Advantage!/EMALL)
- Desire for Government customers order from vendors' own sales database/websites (GSA Advantage!)
- Available only to Federal Government buyers (GSA Advantage!)
- Small range of commercial items carried through it's website (DoD EMALL)
- Internet-based catalog system too costly to implement and maintain (DoD EMALL)
- Not user friendly (FACNET/EDI/EMALL)
- Inadequate effective cross-catalog searches/catalog interoperability (EMALL)
- Interoperability/centralized e-catalog storage (E-catalog/EMALL)

1. The 7-11 of Purchasing

Most of the programs discussed in chapter three, and many others not mentioned in this thesis, provide a means of performing basically only one function each such as excess disposal, auctioning, purchasing, payment, etc. The new system can be likened to

a convenience store, offering a true one-stop website location to perform all acquisition functions. The new system functions as an excess disposal/auction system, electronic storefront purchasing system, a payment system, a vendor performance collection database and a historical database collection system. In addition, the new system encompasses many of the capabilities seen in successful commercial systems currently in use that make them extremely user friendly. The “shopping cart”, the vendor-performance rating scales, the buyer’s vendor-comments, historical purchase trends, disposal and purchasing are functions that are encompassed in successful systems such as eBay, Amazon.com, and many other commercial online purchasing programs. The new program incorporates many of these functions allowing for greater efficiency, cost savings, disposal and purchases. In addition, by blending the Government’s requirements with commercial off-the-shelf technology, the system’s functionality will more easily be able to grow and change compared to legacy Government systems.

2. Volume & Registration

The new system is expected to provide greater purchasing volume than current programs. One reason is that it is intended to be utilized, eventually, by Federal, State and Local Governments as well as include the international arena in the future. As more users participate in this new system, it is expected that more vendors will utilize the system to sell their products and services, and further price reductions will take place as the volume of purchases and competition increases.

One of the complaints by vendors and users of the various Government systems discussed in Chapter three, is the numerous and sometimes cumbersome registration process. Assuming that the vendor is already registered through the CCR, there will not be any additional registration requirements. One issue is not all vendors are required to register with the CCR in order to do business with various Government entities. The DoD, DoT, and NASA are a few of the agencies that do require vendors to register with the CCR prior to awarding any contracts, basic agreements, basic order agreements, BPAs and payment of goods and services. But not all Government entities have that requirement. The concern is if this system is to be open to all Federal, State and Local Governments, by certain agency rules governing CCR registration, not all buyers will be

able to purchase from all vendors utilizing the system to offer their products and services. In addition, if the system is restricted to those vendors that are registered through the CCR, some vendors who would normally sell their products and services to agencies not requiring registration through the CCR on the system, may not utilize the system due to CCR registration requirements. The goal of the program is to have as many vendors as possible sell their products and services through the on-line catalog and to have as many buyers as possible purchasing those products and services. The CCR requirement may undermine that concept. For the DoI and the DoD, for whom this system is initially focused, in this researcher's opinion, there will be no added benefit from additional vendors utilizing the system unless they are registered through the CCR or unless the requirement for some agencies to purchase only from those vendors registered through the CCR is eliminated.

3. Costs

a. Hardware/Software Implementation

One benefit of the new system over existing EDI and FACNET systems is the investment requirement from a hardware and software aspect. As discussed in Chapter three, a vendor desiring to utilize EDI and/or FACNET requires hardware and EDI software to conduct business with the Government. Implementation costs for a large company can be in the hundreds of thousands of dollars in initial costs. In addition, monthly VAN service charges can also be costly. Companies that choose not to perform the EDI/VAN service themselves can utilize third-party EDI/VAN services; but this can also be extremely costly and in some cases, cost prohibitive for some especially small vendors.

The new system avoids these problems by requiring no additional hardware or software other than a basic desktop PC and a browser to access the web. By using a basic PC and a web browser, vendors and buyers can utilize the new system and avoid the cost of EDI/FACNET hardware and software. This in itself breaks down one of the main hurdles many buyers and vendors, especially small businesses, have in implementing on-line procurement methods.

b. Fees

Many of the EDI VAN services usually require either a monthly fee or a per transaction based-fee assessed to its user. Value Added Network fees can also be assessed to users of the FACNET system. GSA charges a one percent fee for supplies, four to eight percent fee for services, and more for auction transactions. Other Federal and State systems require an annual registration fee for the vendors selling products or services through their on-line purchase program. Maryland, for example, charges vendors up to \$225 and a two percent transaction fee to sell products and services on their eMarylandMarketplace website [eMarylandMarketplace Website]. Virginia charges its vendors up to \$200 annually as well as a one percent transaction fee for all orders placed and received through eVA, with a \$500 cap for each order [Virginia Website]. The DoD EMALL technical development (software is hardware) is being funded with Appropriated funding from DISA and DLA. The DLA Inventory Control Points (ICP's) that write DLA contracts are funded through the Defense Business Operating Fund (DBOF) as a result of sales. DLA assesses a three percent cost recovery rate on their catalogs.

The new system receives no Federal funding to operate and will not require an up-front registration fee. It will assess a two percent transaction fee to the buyer and may require an additional transaction fee if other agencies choose to add them on. Care must be taken not to charge customers too much of a cumulative per transaction fee that will undermine any cost savings from increased volume and competition.

The lack of registration fees and assessing the transaction fees upon the buyer will likely entice additional vendors to register through the CCR and offer their products and services on the new system. This, in conjunction with the increase in volume of products and services ordered on the new system and the increased competition, will likely result in even lower prices to buyers, offsetting the nominal fees assessed to the buyers.

4. Reliability

Because this system is currently under development, there is no evidence that its reliability in transmitting orders and requirements will make it to the vendor error free all

the time. However, this researcher has not come across any indication of problems with lost, late or duplicate orders being sent to or from vendors utilizing any of the web-based services discussed in this thesis. In contrast, FACNET users have experienced lost, late and/or duplicate transmissions and shipments. Web-based systems such as this new system are the types of programs Federal FACNET users actually utilize as a workaround to ensure efficient transmission of their requirements. Because payment to the prime vendor is correlated to the size and volume of transactions that take place on this new system, the prime contractor has a significant incentive to ensure transactions occur between buyers and vendors efficiently, effectively and accurately. Vendors also have the incentive to ensure products are shipped correctly and on time as the buyer has the ability to rate the vendor on a numerical scale as well as the ability to comment narratively on the vendor's performance.

5. User Friendliness

Some of the current Government systems such as FACNET, EDI and EMALL, although they may have improved in use and functionality since development, still find that some of their users are very dissatisfied with the usefulness and usability of the system. The new system was developed using many commercial product user-friendly functionalities in mind. The goal was to make the new system as user friendly as possible. Many of the functions and processes discussed earlier were based on current commercial software programs currently in use such as the user-friendly e-bay and Amazon.com websites. The shopping cart model and the vendor performance rating and feedback model for example, while just recently included in some systems such as DoD EMALL, are functions commonly seen using eBay, Amazon.com, that are incorporated into this new system. The prime contractor of this system is developing this system for Government and commercial use. Therefore, the contractor has a direct incentive to ensure the maximum user friendliness, efficiency and flexibility for upgrades and addition of future functionality.

6. Report Generation/Historical Data and Past Performance

A lack of, or inadequate, report generation and/or lack of historical data and past performance are a concern for users of some of the legacy systems as well. The new program addresses those concerns by providing for the collection and retrieval of the buyer's historical purchasing information and vendor past performance data. Buyer/ordering office historical purchase data, as well as exercise/operation specific purchase historical data will be available for use and report generation. Having past purchase information available will save significant effort and costs in data/information research, collection, and organizing. Savings will also be received in the area of purchase and contract preparation of repeat purchases.

The collection and displaying of vendor past performance data on both the mandatory numerical scale and the optional narrative description will greatly benefit the market research capability of the buyer. This will allow the buyer to avoid taking the time to research multiple sources to compare vendor data as a single source or comparatively against other vendors. Quite often, thorough market research is not accomplished due to the time and effort required to perform the research. The new system allows buyers to view vendor past performances and compare past buyer purchases and compare vendors and vendor prices against competitors on the same screen, without having to go to multiple resources. The buyer will then be able to make a better decision based on "best value", utilizing past purchasing decisions and vendor information input by their position and fellow buyers.

7. Availability for Use

Some of the legacy programs are only for use by members of the Federal Government, DoD, etc. For example, GSA Advantage! is only available for use by DoD. Other Federal Agencies, State and Local Governments are currently not allowed to utilize GSA Advantage!. The new system will be available for use by all Federal, State and Local Government agencies. In addition, eventually, it is expected that commercial and international users will be accepted as well. Expanding the number of purchasers that use the system to all Federal, State and Local Governments will significantly

increase the volume of purchases that will take place through this new system. With the increased volume, it is expected that additional vendors will utilize the system to offer their products and services. This may result in increased competition among the vendors, along with the sheer volume of purchases taking place, driving prices down even further. In addition, the system will allow an ordering office to gather orders for like items from all of its requestors and place one order resulting in the ability to take advantage of reduced prices for bulk purchases.

8. E-Storefront/E-Catalog and Interoperability

E-catalog issues and catalog interoperability appeared to be the most common complaints among users of legacy systems such as GSA Advantage! and DoD EMALL. Some of the more common complaints among vendor users of these systems are the amount of data required to place their items on the EMALL website, duplicate vendor data required, out-of-date orders received, the small amount of items carried on some of the e-catalog websites, the cost to implement and maintain an e-catalog system, ineffective cross-catalog searches and lack of interoperability among e-catalogs to be some of the more common complaints. DoD EMALL has improved its e-catalog interoperability by utilizing the ePort program but it still requires vendors to maintain a separate vendor e-catalog.

The new electronic purchasing system is developed to obtain vendor catalog information from vendors and centrally locate all of the catalogs for access by buyers. However, much of the discussion between NPS and the prime contractor focused on the method and format in which to collect the vendor information. The contractor must be aware of some of the issues among vendors. These issues include:

- Vendors required to provide too much electronic catalog information and sometime duplicate information from their own websites..5 tab
- Some vendors lack the expertise to implement and maintain an e-catalog.
- The e-catalog system needs to be responsive to changes and in placing orders. Some of the vendors have indicated that through GSA Advantage!, orders are out of date upon receipt.
- Vendors desire that Government buyers order directly from vendors' own website sales database.

- An internet-based catalog system is too costly for some businesses to implement.
- E-catalog cross searches are inadequate and ineffective.

Vendors in the Government contracting community cover the entire spectrum from large businesses down to micro-businesses. The catalog system for these vendors differs from well-established systems run by large businesses down to no systems at all for many micro-businesses. The operation of the pure electronic contracting system requires inclusion of all vendors that have electronic catalogs. This necessitates a system that supports a centralized catalog for all vendors.

The biggest hurdle with this function is obtaining the electronic catalogs from all vendors. First, this system will accommodate all vendors that are registered through the CCR. Currently, the CCR contains over 202,000 registered vendors. This system is limited to the same vendors registered in the CCR. Even so, registered vendors may not participate in this new system for many reasons.

Duplicate information. As stated above, vendors may decide not to sell their products on this new system due to the data requirements. Vendors that currently have e-catalogs established may not desire to report their e-catalog to the new system requirements. Some vendors have expressed a desire to allow Government buyers to purchase items through the vendor's sales database/vendor website, thereby avoiding the need to format, send and continuously update data to the new system central e-catalog location. Linking in to vendor e-catalogs on the vendor websites vice locating the e-catalogs centrally at the contractor's site would reduce the contractor's overhead in maintaining the numerous vendor e-catalogs. Another option is to use a product similar to what GSA Advantage! currently uses. GSA uses a product called WebMethods that enables the agency to automatically grab information directly off the vendors' website, avoiding the vendor having to duplicate and/or reformat their website data for display on the new system. The DoD EMALL utilizes ePort. The ePort technology forms the backbone of the catalog searching capabilities, which allows the access of supplier's working data from the supplier's database where it resides [Partnet].

WebMethods focuses on “pushing” business critical information from one application to another – synchronizing updates across systems. Webmethods helps “pull” data from multiple places while delivering a unified view to the user. This technique is demand-based where a unified view of data is created in response to a user query. [Webmethods]

Cost. Some vendors, especially small businesses, that currently have e-catalog systems in place may want to configure their e-catalogs to work on the new system but may not be able to afford the effort required to perform and maintain this new set of data. Also, many vendors may lack the funding and not have the ability to hire the expertise to maintain an e-catalog system.

Responsiveness. To ensure accurate orders are placed, vendors must be able to update their product information in a timely manner. The EMALL, for example, updates their vendor data every night. This also comes at a cost to the vendor as well in paying for e-catalog maintenance. In addition, orders placed against an on-line catalog must be processed and sent to the vendor in a timely manner.

Implementation Assistance. For vendors that may not be able, technically or financially, to establish an e-catalog, and in order to obtain as many vendors utilizing this new system as possible, assistance may be required. For example, the eMarylandMarketplace utilizes a supplier enablement team to assist such vendors in creating an e-catalog in minutes. This has helped the number of vendor e-catalogs and vendor items available through eMarylandMarketplace to rise significantly [eMarylandMarketplace Website].

Technical Data and Drawings. Although this functionality is not discussed in this thesis and the functionality itself is a long-term goal of the new electronic purchasing system, it is an issue to mention. There will no doubt be a need to display product pictures, technical data and drawings on this new system. In addition, there may be a need for buyers to transmit technical data and drawings to vendors from which the buyer desires quotes. Some businesses, especially small firms, lack the adequate resources to adequately utilize the web to upload and/or download required technical data.

D. CHAPTER SUMMARY

This chapter began by introducing the reader to the new Pure Electronic Contracting/Purchasing System. Some of the functionalities associated with the new system were discussed and where applicable, issues and concerns from chapter three were included. Some of the specific system benefits were then discussed, particularly concerning the electronic storefront portion of the new system.

The intent of this chapter was to familiarize the benefits this new system has over existing, stand-alone, Government systems and the benefits the Government could derive from the use of the system. It provides a rough outline of how the system will operate and gives an assessment of the intended capabilities of this new system in comparison to existing systems. What should be taken away from this chapter is that the new system, although in development, potentially has benefits over legacy systems and is in keeping with the decade-long and necessary trend of electronic commerce, on-line procurement, streamlining of on-line purchasing, use of a commercial product, improvement over problems with legacy systems, and the improvement in efficiency and effectiveness of on-line purchasing in the Federal Government.

Chapter V provides recommendations and a summary conclusion for the thesis. It also provides a summary of the research questions as outlined in Chapter I, and suggested areas of further research.

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V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The previous chapters gave a broad overview of the events and regulations that govern Government e-commerce/e-procurement initiatives and capabilities. It also gave an overview of some of the State Government on-line contracting/procurement programs. As was shown throughout this thesis, the evolution and maturation of on-line purchasing/contracting programs continues to possess enticing propositions for Government and private sector officials and leaders. The potential cost and effort savings in purchasing activities and processes that can be gained through utilizing on-line purchasing systems are quite large and may potentially be better improved by the development and implementation of the new pure electronic purchasing/contracting system discussed throughout this thesis.

Current procurement systems help the Federal, State and Local Governments achieve their goal of conducting contracting and purchasing transactions electronically and on-line. Current programs also provide significant savings in purchasing process efforts, lower prices through volume purchasing, and increased efficiency. However, despite the successes and praises of these legacy systems, many of the current on-line purchasing programs have problems and areas of concerns as discussed throughout chapter III. Non-affordable hardware/software implementation and maintenance costs, ineffectiveness, a lack of user friendliness and numerous data transmission problems are common issues with EDI and the FACNET system. Lack of proper functionality, inadequate report generation, and inadequate historical data access and past performance information are a few of the issues with the SPS system. GSA Advantage! and DoD EMALL, while providing a good service to its customers, also have many issues and concerns including too much required information/duplication of vendor website e-catalog information, outdated orders received by the vendor, low return compared to required monetary and manpower investment, lower than desired sales volume, limited user availability, relatively small range of items carried through the Advantage! Website, and inadequate effective cross-catalog searches and catalog interoperability. Although

some of these issues have been or are currently being addressed within the specific systems, they are good “lessons learned” for this new system to address during its development and implementation.

The new electronic purchasing program, although not fully developed at this time, shows great potential and promise in addressing some of the issues with legacy systems discussed. The system was designed by students with experience in contracting and in utilizing some of the legacy on-line ordering systems. Therefore, this new system will incorporate commercial world system user friendliness, system capability, and will address and incorporate functionalities discussed with current systems. There's also the potential for the new system to obtain purchasing volume above and beyond that currently recognized by legacy systems due to the ability of all Federal, State and Local Governments to use this system.

B. RECOMMENDATIONS

This author recommends that development and testing of this new on-line procurement program be continued to explore its benefits and feasibility. The application of this program from a commercial format and aspect lends itself well for such a program by meeting the needs of the Government while maintaining a commercial foundation, allowing the contractor the ability to utilize the same program in the commercial arena. This may result in even greater savings for purchasers and increased sales for vendors.

It is recommended that clear metrics be established so that this new system can be accurately evaluated as to its reliability, efficiency and effectiveness so an accurate comparison can be made between this new program and current on-line purchasing programs. Despite the problems and issues with current on-line procurement programs discussed in chapter III, there are some good aspects to these current programs allowing them to provide some benefit to the users. Therefore, for this program to be successful and to be incorporated as the one on-line procurement tool to use in Federal, State and Local Government departments and agencies, the new program will have to prove the ability to offer benefits above and beyond current programs. Clear, understandable and measurable metrics will allow for this comparison.

It is also recommended that marketing of the program be given significant effort and focus by the contractor developing and maintaining this new program. Again, as there are already many on-line procurement programs currently in use, the contractor will need to sell the benefits of this new program to vendors and purchasers throughout the Federal, State and Local Governments. Positive results from detailed and accurate metrics will provide one tool the contractor can use in promoting this new program.

C. SUMMARY AND REVIEW OF RESEARCH QUESTIONS

Primary Research Question

- What are some of the current Government acquisition/procurement programs, problems and issues associated with legacy systems and to what extent can the Pure Electronic Storefront system improve on the current systems in use.

Current Government on-line procurement programs and their related issues are described throughout Chapter III. The issues described for each of the current programs are good lessons learned for the new on-line procurement program. Some of the current systems continue to improve their use and functionality for both vendors and buyers and it is not yet proven that the new on-line procurement program will provide benefits above and beyond current program capabilities. However, by identifying these issues and concerns now, upfront, the new program will likely be able to avoid the setbacks and pitfalls the legacy systems have had to deal with.

Secondary Research Questions

- What is the history of Electronic Commerce/Electronic Procurement and other procurement programs?

As discussed throughout Chapter II, the history of EC/EP stems back to the early 1990's with the implementation and findings of the NPR. The NPR was later followed by various presidential memorandums, EC action teams, FASA in 1994 and FARA in 1996, which propelled the efforts towards EC/EP, and most recently a rededication by the current administration for the use of electronic Government and electronic procurement

within the Federal Government. Other efforts to help implement on-line commerce and procurement include the Defense Reform Initiative and changes to the FAR. Chapter III identifies and discusses just a few of the many electronic means for Federal, State and Local Government's to conduct electronic transactions to include purchasing and contracting. These systems include Federal Government systems such as EDI, FACNET, SPS, GSA Advantage!, and DoD EMALL/E-catalogs and include new State Government systems such as eMarylandMarketplace.com can eVa.com.

- What are problems/weaknesses of some of the current electronic procurement programs?

Chapter III includes a plethora of weaknesses and issues of current on-line procurement systems. While some of the issues and problems are specific to a particular system, some are identified across a couple different systems. These issues and problems include the high costs to implement and/or maintain, poor effectiveness and usability, ineffectiveness, transmission problems, less than expected savings of time, money and increase in productivity, lack of functionality, inadequate report generation capability, inadequate access to historical purchasing and past performance data, too much/duplication of vendors' own website database, low return to vendors compared to monetary and effort investment, lower than desired sales volume, limited availability, and interoperability/centralized e-catalog storage.

- What advantages/solutions can the Pure Electronic Storefront System bring to the Government?

Chapter IV details just some of the advantages that the new system will entail. One advantage is the consolidation of different functions such as contracting, procurement and auctioning/disposal system, into this one program vice having to utilize different programs. Other functions that will be included are a vendor performance collection database and a historical purchase database. Another potential benefit is the increased volume of purchases through the system due to the increased number of buyers (Federal, State and Local Government purchasers) utilizing the system. Other identified benefits of this new system include low to no hardware and software implementation and maintenance costs, no annual registration fees, low transaction fees, potential for

increased reliability due to contractor financial incentives, and improved report generation, historical and past performance data. With this new system currently under development and testing, it is not known for sure that all these benefits will be realized or that the new system will be an improvement over legacy systems in all aspects. However, because this system is being developed using commercial processes and commercial functionalities, the new system will be incredibly flexible to changes and modifications.

D. SUGGESTED AREAS FOR FURTHER RESEARCH

This exploratory study has only focused on a few of the functionalities the new on-line procurement program utilizes and the potential it has over existing systems in-use. Important areas for further research are:

- What will be the economic impact(s) of this new program on the department(s) using it, and are there other indirect economic impacts as well?
- Analyze the payment process this system will use. Will the payment process this system utilizes provide any significant benefits over the existing complex DFAS system?
- Internet security has become a top priority among all Government and commercial applications utilizing the Internet. How does this new on-line system address Internet security?
- Conduct and analyze actual effectiveness of this new system once testing data starts to accumulate.
- What are the issues relating to electronic contracting and electronic signatures? How does this new program comply with current regulations regarding electronic contracting and electronic signatures?

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APPENDIX: LIST OF ABBREVIATIONS

CCR	Central Contractor Registration
DFARS	Defense Federal Acquisition Regulations
DLA	Defense Logistics Agency
DOD	Department of Defense
DOI	Department of Interior
DRI	Defense reform Initiative
DSMC	Defense Systems Management College
DUSD(AR)	Deputy Under Secretary of Defense (Acquisition Reform)
EB	Electronic Business
EC	Electronic Commerce
ECAT	Electronic Commerce Acquisition Team
E-CATALOG	Electronic Catalog
ECIC-PAT	Electronic Commerce in Contracting Process Action Team
ECRC	Electronic Commerce Resource Center
EDI	Electronic Data Interchange
EFT	Electronic Funds Transfer
EMALL	Electronic Mall
EP	Electronic Procurement
FACNET	Federal Acquisition Network
FAR	Federal Acquisition Regulation
FARA	Federal Acquisition Reform Act
FASA	Federal Acquisition Streamlining Act

FEAT	Federal Electronic Acquisition Team
FSS	Federal Supply Schedule
GAO	General Accounting Office
GPEA	Government Paperwork Elimination Act
GSA	General Services Administration
IDIQ	Indefinite Delivery, Indefinite Quantity
IG	Inspector General
IT	Information Technology
JECPO	Joint Electronic Commerce Program Office
JWOD	Javits-Wagner O'Day
NPR	National Performance Review
NPS	Naval Postgraduate School
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget
PTAC	Procurement Technical Assistance Center
RFP	Request For Proposal
SAP	Simplified Acquisition Procedures
SBA	Small Business Administration
SPS	Standard procurement System
VAN	Value Added network

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